



# Wandoan Coal Project Environmental Impact Statement

Integrated EIS Summary

December 2008

# Table of Contents

## Preface

Acknowledgements 1

EIS Display Locations 1

## Integrated Environmental Impact Statement Summary

1 Wandoan Coal Project 2

2 Aims and Objectives 2

3 The Proponent 6

4 Legal Framework - Environmental Assessment Process 6

5 Project Need and Justification 12

6 Alternative Options 12

7 Project Description 12

8 Consultation Process 18

9 Impact Assessment 18

10 Conclusions 38

## LIST OF FIGURES

Figure 1: Locality Plan of Key Project Component 3

Figure 2: Detail plan of Mining Lease Application areas 3

Figure 3: Southern Coal Seam Methane Water Supply Pipeline 4

Figure 4: Western Coal Seam Methane Water Supply Pipeline 4

Figure 5: The raised Glebe Weir inundation area and pipeline route to the Wandoan Coal Project 5

Figure 6: Structure of the Environmental Impact Statement 6

Figure 7: Sustainability Index Logos 6

Figure 8: Outline of Federal and State Approvals Process for the Project 8

Figure 9: Mine Infrastructure Area 17

Figure 10: Viewpoint from the Leichhardt Highway, with existing view 35

Figure 11: Viewpoint from the Leichhardt Highway, after five years of mining 35

## LIST OF TABLES

Table 1: Summary of Approvals Required 9

Table 2: Indicative Project Timing 13

DISCLAIMER – This document is an executive summary of the key findings of the Project Environmental Impact Statement (EIS). This document does not constitute the Project EIS, nor does it detail all of the existing environmental values, benefits and potential adverse impacts, or mitigation and management measures relevant to the Project. Full details of the Project and its components are contained in the main body of the EIS.

# Preface

The Environmental Impact Statement (EIS) for the Wandoan Coal Project (the Project) consists of four Volumes. Volume 1 covers the mining lease application (MLA) areas and surrounding lands; with other Volumes assessing three alternative operational raw water supply options. Volumes 2 and 3 cover the southern and western coal seam methane (CSM) water supply pipelines respectively, and Volume 4 covers the Glebe Weir raising and pipeline raw water supply option (Glebe Option).

## ACKNOWLEDGEMENTS

The Volumes 1, 2 & 3 of the EIS have been prepared by Parsons Brinckerhoff Australia Pty Ltd and their specialist environmental sub-consultants for the Wandoan Joint Venture. The assessment team drew primarily on in-house resources in project approvals; community consultation; construction activities; mining operations; climate; land use; geology, mineral resources, overburden and soils; groundwater; water supply and management; transportation; terrestrial ecology; waste management; social assessment; economics; hazard and risk assessment; health and safety; decommissioning; and cumulative impacts assessment. Specialist technical contributions were provided in:

- » groundwater contributed to by Streamline Hydro
- » air quality, by Katestone Environmental Pty Ltd
- » greenhouse gas assessment and climate change, by URS Australia Pty Ltd
- » noise assessment, by Connell Wagner Pty Ltd

- » vibration assessment, by Scott Mine Consulting Services Pty Ltd
- » terrestrial flora ecology, contributed to by PLACE Environmental
- » terrestrial fauna ecology, contributed to by Lewis Environmental & Ecological Services
- » aquatic ecology, by frc environmental
- » visual amenity, by Intergral Landscape Architecture & Visual Planning
- » non-Indigenous cultural heritage, by Bonhomme Craib & Associates

Volume 4 of the EIS was prepared by MWH for Sunwater Ltd.

General technical guidance was provided by Xstrata Coal Queensland, Xenith Consulting and Sedgman Ltd.

Legal, native title and Indigenous cultural heritage assistance was provided by Allens Arthur Robinson, Australia.

## EIS DISPLAY LOCATIONS

Members of the public may review copies of the EIS document during normal office hours at the following locations:

- » Wandoan –
  - » Library and Council Customer Service Centre,
  - » WJV's Project Information Centre in Royds Street Wandoan, (next to the pharmacy)
- » Taroom – Library and Council Customer Service Centre
- » Miles – Pioneer Library.

DISCLAIMER – This document is an executive summary of the key findings of the Project Environmental Impact Statement (EIS). This document does not constitute the Project EIS, nor does it detail all of the existing environmental values, benefits and potential adverse impacts, or mitigation and management measures relevant to the Project. Full details of the Project and its components are contained in the main body of the EIS.

# Integrated Environmental Impact Statement Summary

## 1 WANDOAN COAL PROJECT

This Integrated Environmental Impact Statement Summary summarises the key findings of the Environmental Impact Statement (EIS) for the Wandoan Coal Project (the Project).

The Project will comprise an open cut coal mine and supporting infrastructure, producing around 30 million tonnes of Run of Mine (ROM) coal per year. The Project is situated in the Surat Basin to the west of the Wandoan township, located approximately 350km northwest of Brisbane and 60km south of Taroom. The Wandoan township is an agriculture based community with a population of approximately 380 people.

The thermal coal deposits for the Project are estimated to be in excess of 1.2 billion tonnes located within three Mining Lease Applications (MLAs 50229, 50230 and 50231). The MLAs comprise approximately 32,000 hectares. Approximately 11,000 hectares of the MLAs will be used for mining operations. The remaining land will act as a buffer between operations and sensitive receptors.

The Project will be mined using dragline, truck and excavator equipment. It is proposed that the coal will be crushed, processed and blended on site before being transported by rail to the Gladstone area for export.

The Project EIS identifies and assesses the potential environmental, social and economic impacts (direct, indirect and cumulative) of the Project, proposes measures to avoid or mitigate any adverse impacts, enhance the beneficial impacts and manage residual impacts during the construction, operation and decommissioning phases.

The WJV makes a number of commitments to enhance the environmental, social and economic benefits of the Project. These commitments have been developed to reflect the outcome of consultation with the local community and other key stakeholders, as well as the WJV's Sustainable Development Policy. The WJV's key commitments are listed in section 10 of this Integrated EIS Summary. Full commitment lists are contained in Chapter 28 of Volumes 1 – 3 and Chapter 22 of Volume 4.

Overall, the EIS concludes that, with the implementation of the proposed mitigation measures, the impacts of the Project will be

appropriately managed whilst providing significant economic, as well as other, benefits for the local, regional, state and national economies.

## 2 AIMS AND OBJECTIVES

The Project plans to establish an open cut coal mine in the Wandoan area of the Surat Basin as an energy resource for the international and potentially domestic coal markets. The Project will significantly contribute to the local, regional, state and national economies through royalties, taxes, and wages, and by creating opportunities for regional employment and training, regional development, small business, development of secondary industries, and improved local infrastructure.

## 3 PROJECT OVERVIEW

An overview Locality Plan of the key components of the Wandoan Coal Project is shown in Figure 1. The Project includes:

- » open cut mining of thermal coal and ancillary mine infrastructure components, described in detail in Volume 1 of the EIS. Figure 2 provides indicative locations of the mine pits and some ancillary infrastructure
- » three alternative raw water supply options for the operating life of the Project, with one of the options to be selected by the WJV for final development:
  - › southern coal seam methane (CSM) water supply pipeline and associated infrastructure, with further details described in Volume 2 of the EIS. Figure 3 shows the proposed pipeline alignment.
  - › western CSM water supply pipeline and associated infrastructure, with further details described in Volume 3 of the EIS. Figure 4 shows the proposed pipeline alignment.
  - › Glebe Weir raising and associated pipeline infrastructure (Glebe Option), with further details described in Volume 4 of the EIS. Figure 5 shows the location of Glebe Weir and the proposed pipeline route.

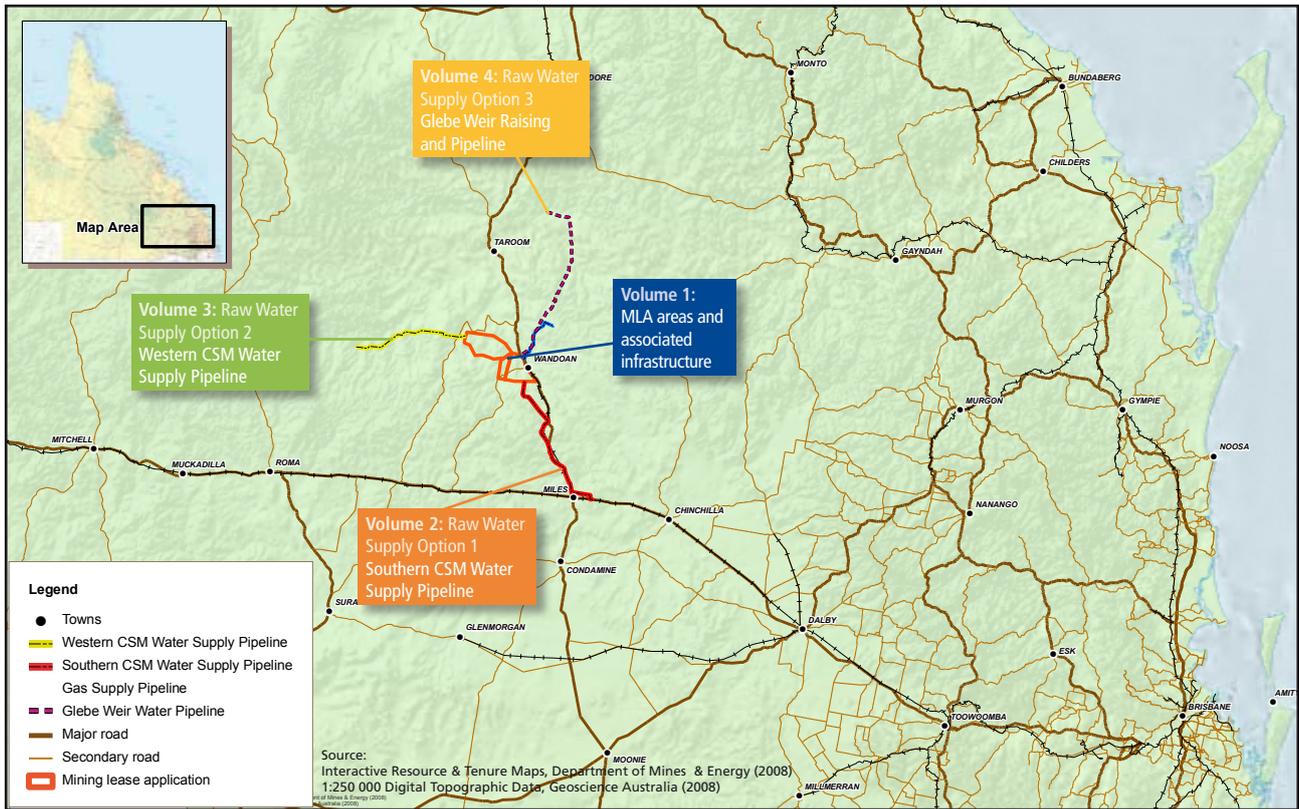


Figure 1: Locality Plan of Key Project Components

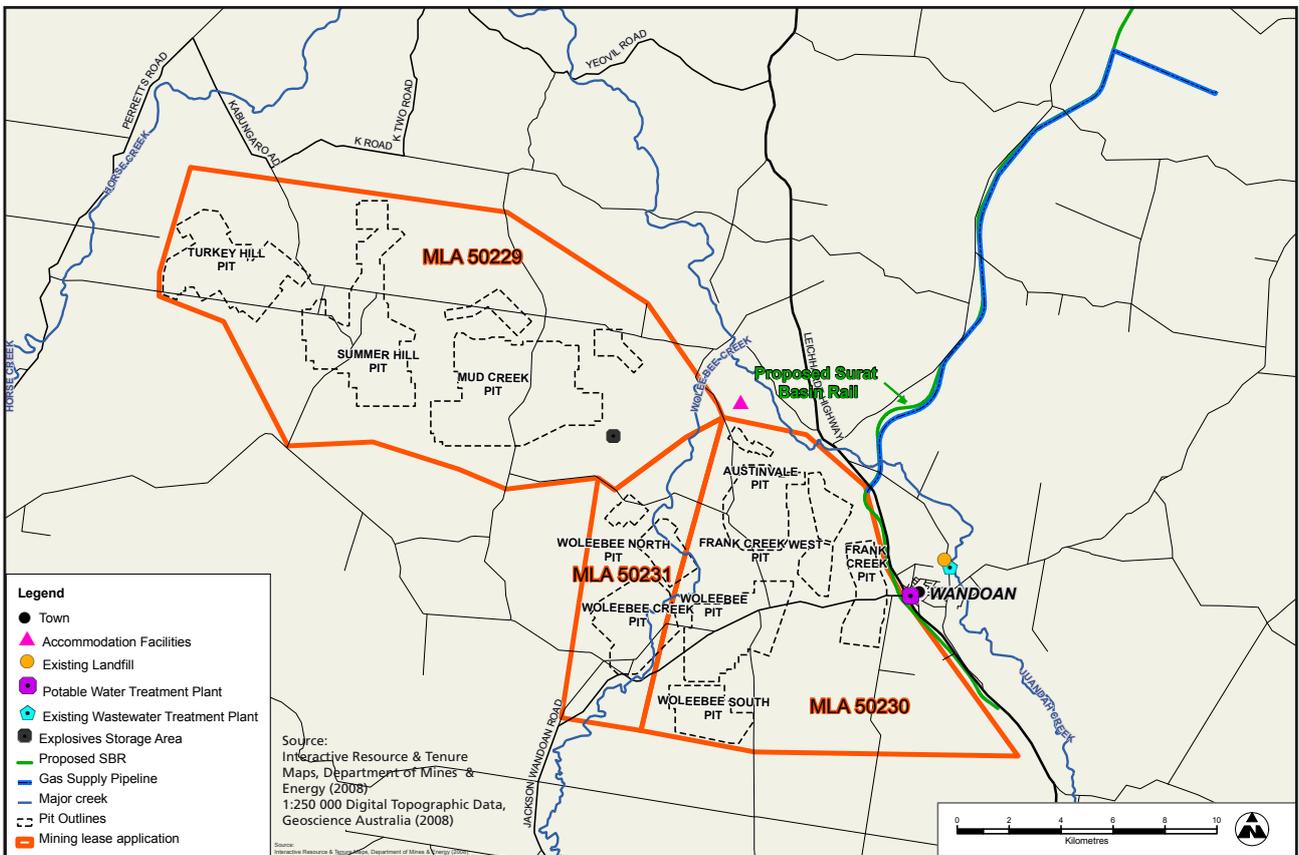
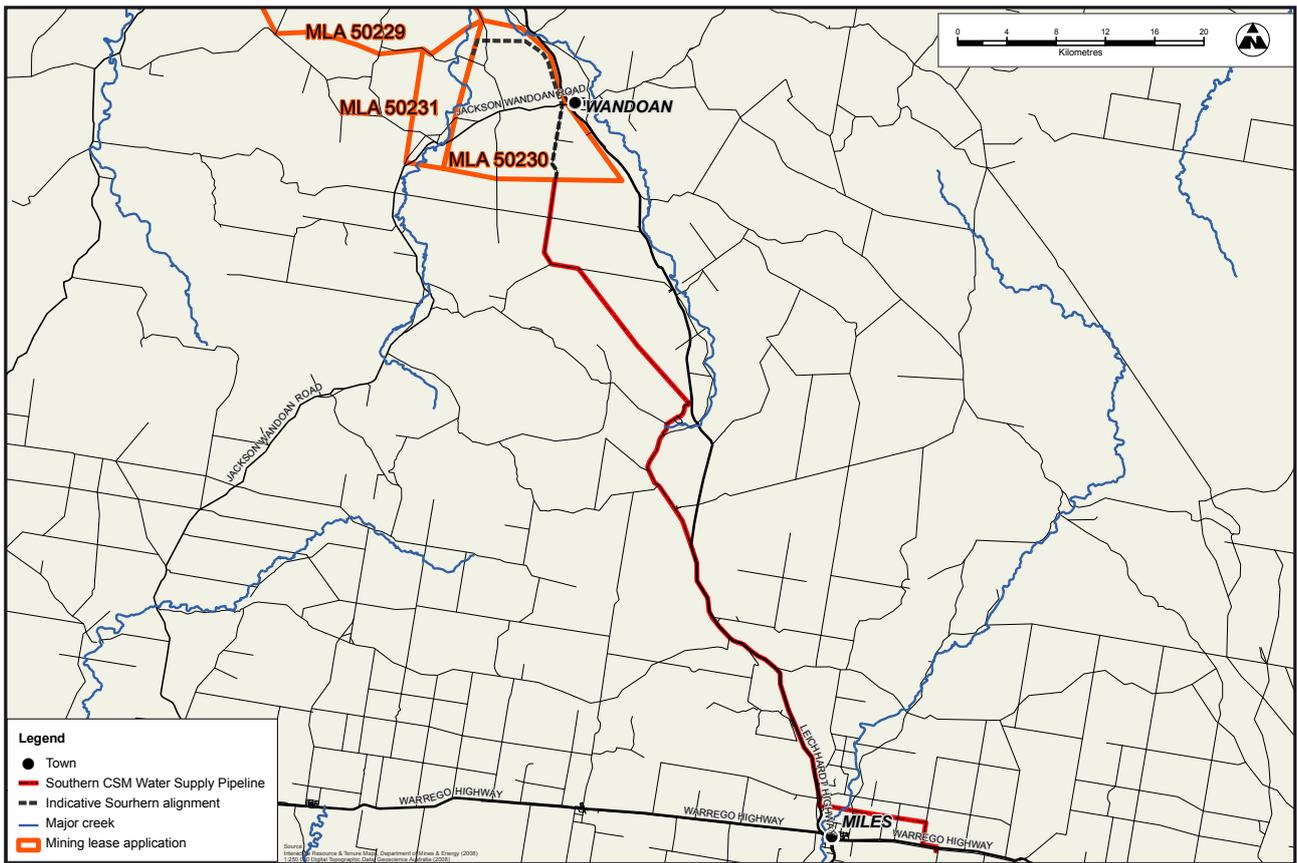


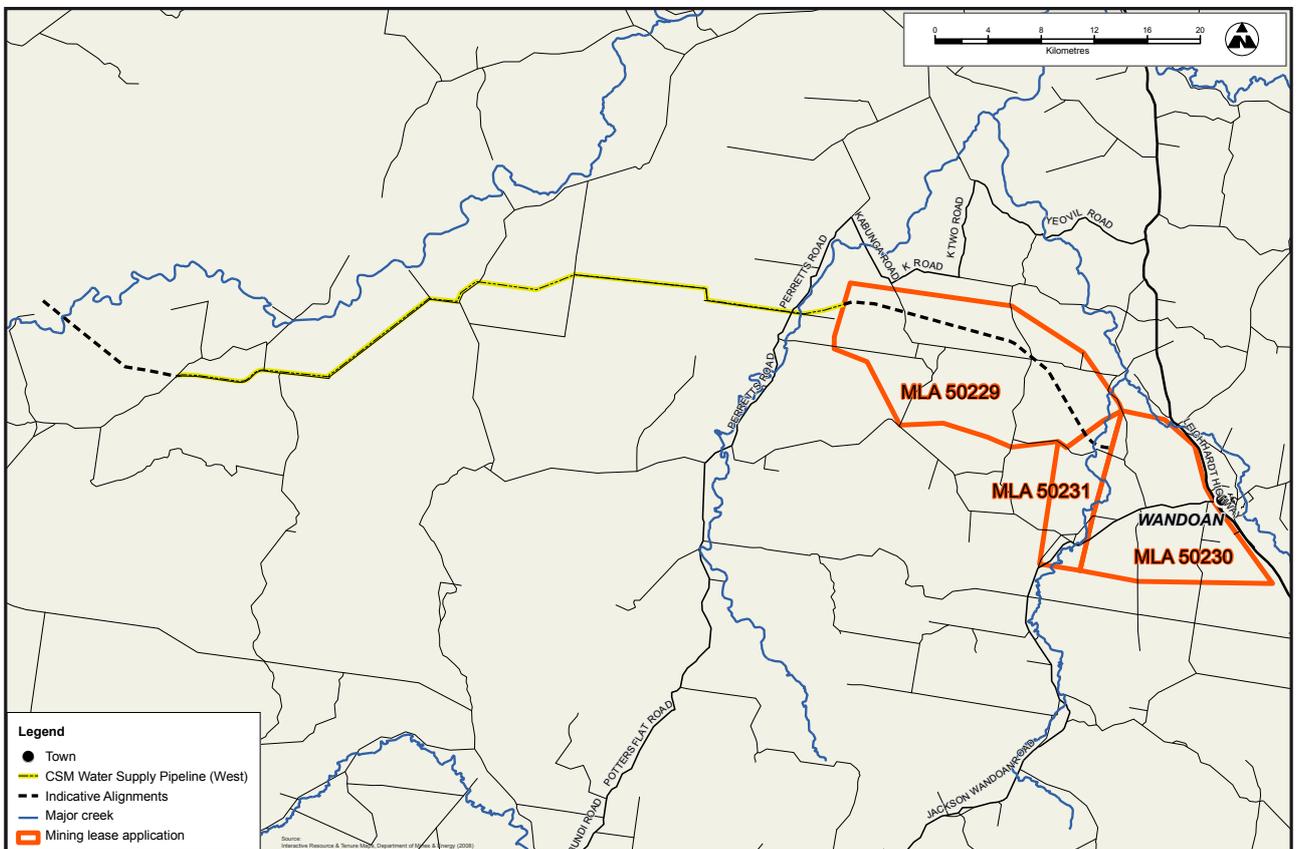
Figure 2: Mining Lease Application (MLA) areas

Large scale Figure is provided as Figure 6-1-V1.3 in Volume 1, Book 3 of the EIS



**Figure 3: Southern Coal Seam Methane Water Supply Pipeline**

Large scale Figure is provided as Figure 1-1-V2.3 in Volume 2, Book 3 of the EIS



**Figure 4: Western Coal Seam Methane Water Supply Pipeline**

Large scale Figure is provided as Figure 1-1-V3.3 in Volume 3, Book 3 of the EIS

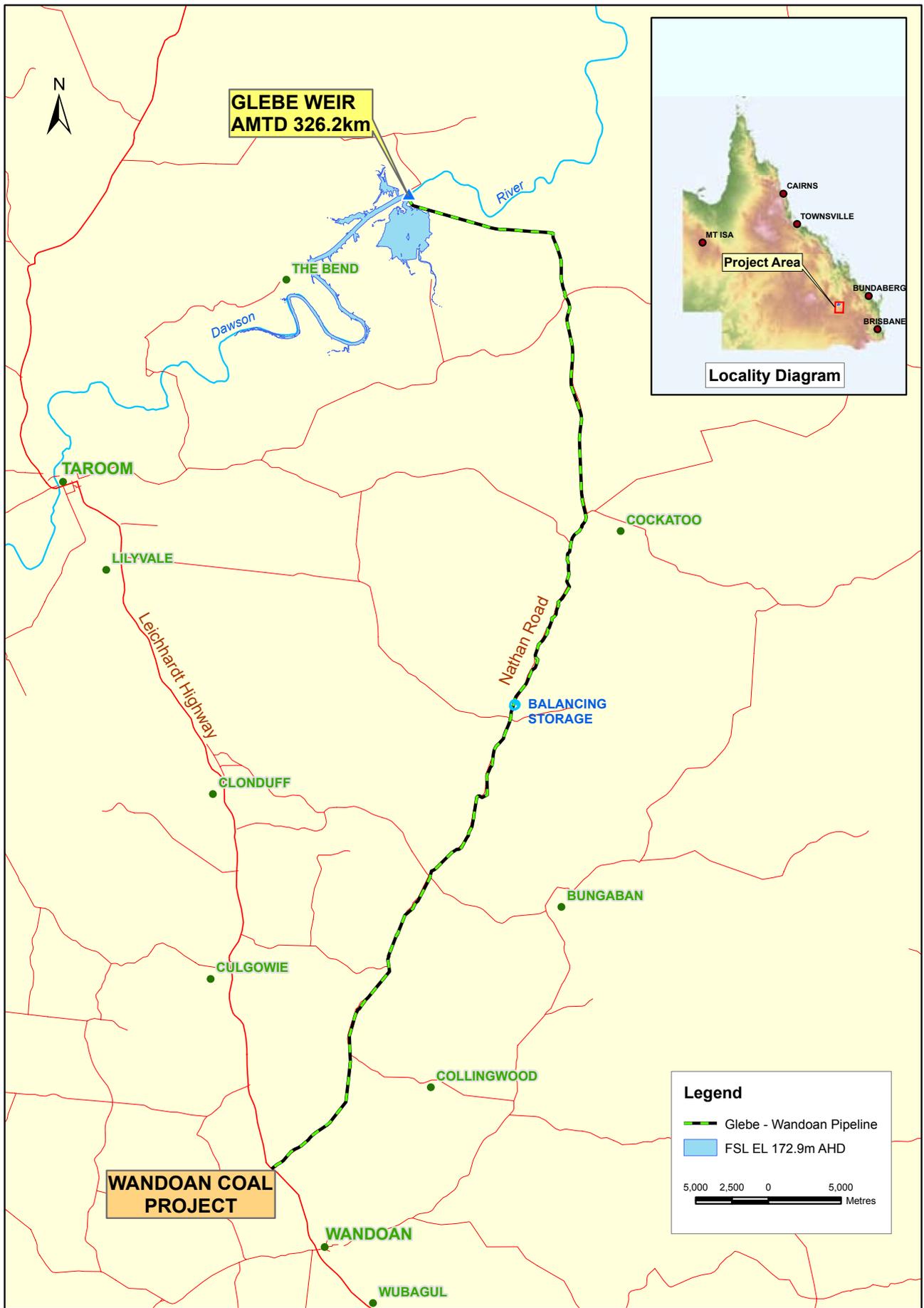


Figure 5: Glebe Weir Raising and proposed Raw Water Supply Pipeline

The EIS has been divided into four inter-related environmental impact assessments, as depicted in Figure 6.

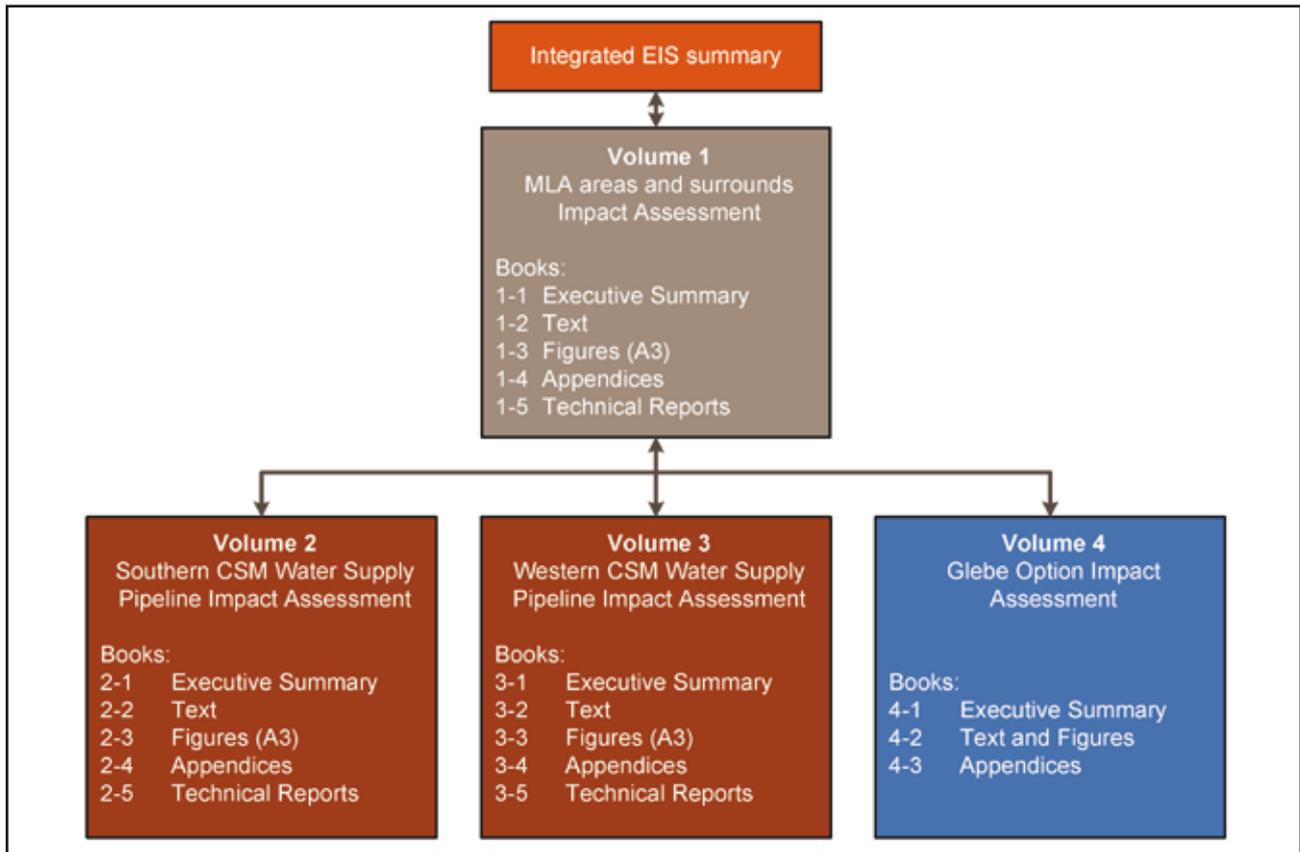


Figure 6: Structure of the Environmental Impact Statement



Figure 7: Sustainability Index Logos

## 4 THE PROPONENT

The Wandoan Coal Project Proponent is the Wandoan Joint Venture (WJV). The partners of the Project are:

- » Xstrata Coal Queensland Pty Ltd (75%)
- » ICRA Wandoan Pty Ltd (12.5%) and
- » Sumisho Coal Australia Pty Limited (12.5%).

Xstrata plc is a global diversified mining group, listed on the London and Swiss Stock Exchanges, with its headquarters in Zug, Switzerland. Xstrata's businesses maintain a meaningful position in seven major international commodity markets: copper, coking coal, thermal coal, ferrochrome, nickel, vanadium and zinc, with a growing platinum group metals business, additional exposures to gold, cobalt, lead and silver, recycling facilities and a suite of global technology products, many of which are industry leaders.

Xstrata plc has been recognised by the Dow Jones Sustainability Index ("DJSI") as the Global Super Sector Leader for Basic Resources in its World and STOXX Indexes for 2008/2009, (see Figure 7). This is the second consecutive year that Xstrata has been named as the resources sector leader and third year that Xstrata has been included in the Dow Jones Sustainability Indexes of sustainability leaders. Xstrata has also been rated as the sector leader in the 2007 Australian Corporate Responsibility Index.

Xstrata Coal, the coal commodity business of Xstrata plc, is the world's largest exporter of thermal coal and the fifth largest producer of hard coking coal. With its headquarters in Sydney, Australia, Xstrata Coal has interests in more than 30 operating coal mines throughout Australia, South Africa and Colombia.

Xstrata Coal Queensland (XCQ), has its headquarters in Brisbane, and operations across Queensland. In 2007, XCQ produced 34.7 million tonnes of thermal and coking coal for the Asia-Pacific export market.

XCQ manages several existing operations including the Oaky Creek Mine east of Tieri (underground operations), the Newlands Mine (underground and open-cut operations) near Glenden, the Collinsville Mine (open-cut operations) at Collinsville, and the Rolleston Coal Mine (open-cut operations) near Rolleston.

ICRA Wandoan Pty Ltd and Sumisho Coal Australia Pty Limited are both Australian subsidiaries of major Japanese trading houses with interests in numerous industries including mining, power generation and commodity trading.

XCQ will manage the Project on behalf of the WJV, and brings considerable operational and development experience to the Project.

XCQ is committed to the highest standards of environmental management and performance, including the proactive prevention of risks

through leading industry practice environmental monitoring programs. XCQ implements a combined Health, Safety, Environment and Community (HSEC) Management System in line with seventeen Sustainable Development Management Standards. Those Standards are the subject of rigorous, independent auditing under Xstrata's global Sustainable Development Assurance Program.

Xstrata's policies and management standards will be adopted by the WJV for the Project. Chapter 1 of Volume 1 outlines key aspects of Xstrata's Sustainable Development Policy (encompassing health and safety, the environment, sustainable communities and people) that will be adopted by the WJV. A full copy of Xstrata's Sustainable Development Policy, and Climate Change Position Statement are provided in Volume 1 of the EIS, and are also available at: [www.xstrata.com/sustainability](http://www.xstrata.com/sustainability)

In terms of the three alternative operational raw water supply options, if either of the CSM water supply pipeline options are selected by the WJV, it is currently intended that the pipeline will be managed and operated by the WJV (or associated party). If the Glebe Weir raising and pipeline option is selected, SunWater Limited, as owner and operator of the Glebe Weir, will undertake the weir raising and pipeline construction. SunWater is a government-owned corporation (GOC). As a specialist water service provider, SunWater has extensive expertise in operating and maintaining dams and weirs, pump stations, pipelines, open channels and drainage systems, particularly on the Dawson River. SunWater provides bulk water supply services to over 6,000 customers and water consultancy services to a range of industry clients.

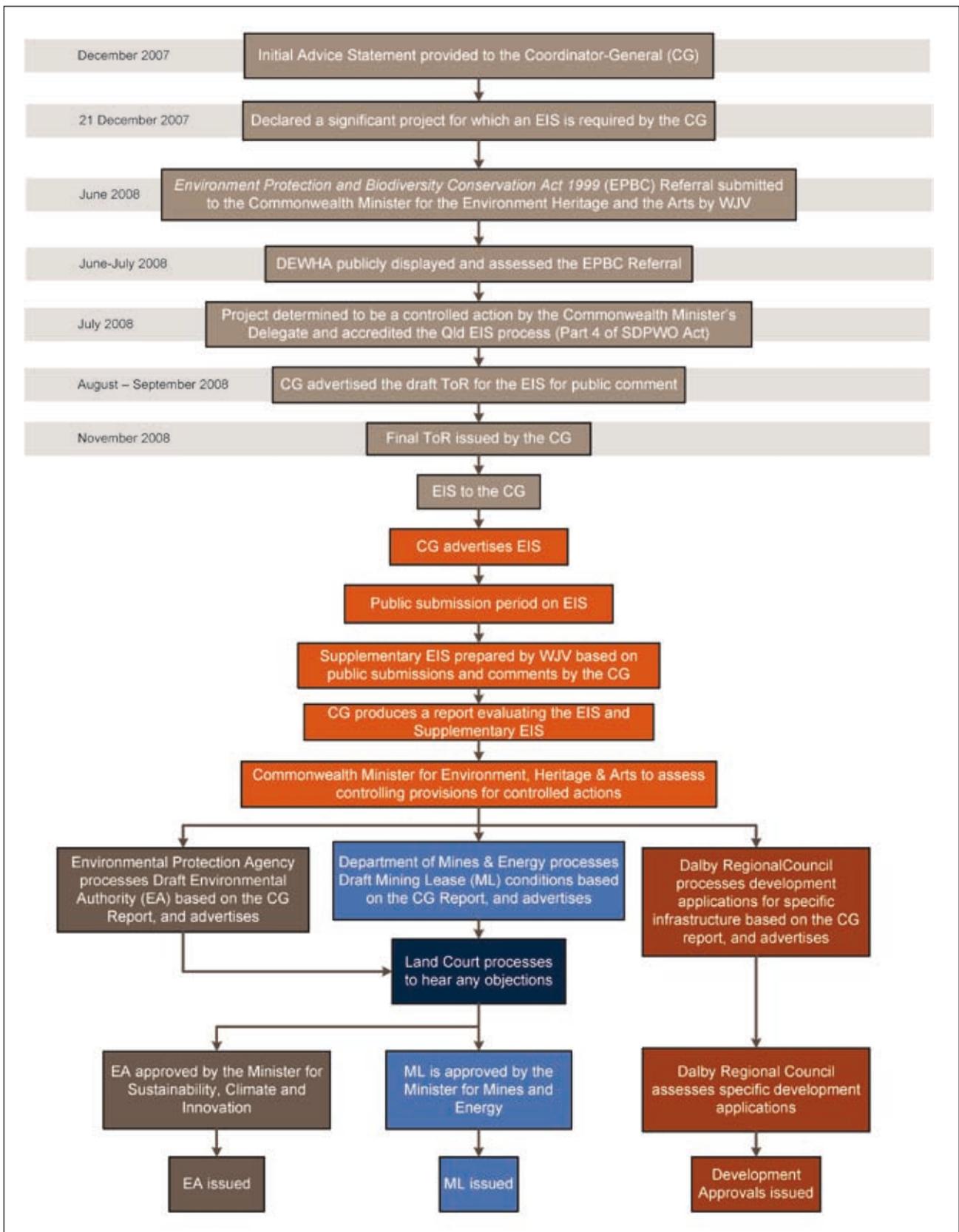
Contacts details for the WJV are:

Wandoan Joint Venture  
GPO Box 2587  
Brisbane Qld 4001 Australia  
Telephone: (07) 3115 5300  
Facsimile: (07) 3115 5412  
[wandoaninfo@xstratacoal.com.au](mailto:wandoaninfo@xstratacoal.com.au)  
[www.wandoancoal.com.au](http://www.wandoancoal.com.au)

## 5 LEGAL FRAMEWORK - ENVIRONMENTAL ASSESSMENT PROCESS

The Wandoan Coal Project was declared a significant project for which an EIS is required by the Coordinator-General under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) on 21 December 2007. The EIS process is being coordinated by the Department of Infrastructure and Planning on behalf of the Coordinator-General.

In June 2008, the WJV referred the Project to the Commonwealth Minister for the Environment, Heritage and the Arts under



**Figure 8:** Outline of Federal and State Regulatory Approvals Process for the Project

the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as four interrelated EPBC Referrals addressing:

- » the mine and infrastructure (referral reference number 2008/4284)
- » southern CSM water supply pipeline (referral reference number 2008/4287)
- » western CSM water supply pipeline (referral reference number 2008/4283)
- » Glebe Weir raising and pipeline (referral reference number 2008/4285).

On 21 July 2008, the Minister's delegate decided that each of the components of the Project were controlled actions, for which:

- » the relevant controlling provisions for all four were Sections 18 and 18A (listed threatened species and ecological communities)
- » for the Glebe Weir raising and pipeline only, the additional relevant controlling provisions were sections 20 and 20A, relating to listed migratory species.

In accordance with the Commonwealth Minister's decision on the assessment approach, the Project will be assessed under the Bilateral Agreement with the Queensland Government. Under the Bilateral Agreement, the Australian Government has accredited the SDPWO Act EIS process to meet the impact assessment requirements under both Commonwealth and State legislation.

Figure 8 outlines the Federal and State Regulatory Approvals Process for the Project.

The Coordinator-General's report will be publicly notified and provided to the Commonwealth Minister for the Environment, Heritage and the Arts for determination of approvals under the EPBC Act. The Coordinator-General's report may state conditions that are to attach to subsequent approvals required for the Project. The following are the main approvals required for the operation of the mine and related infrastructure:

- » approvals under the Commonwealth EPBC Act from the Commonwealth Minister for the Environment, Heritage and the Arts
- » an Environmental Authority under the *Environmental Protection Act 1994* (Qld) approved by the Minister for Sustainability, Climate and Innovation
- » a Mining Lease under the *Mineral Resources Act 1989* (Qld) granted by the Minister for Mines and Energy.

In addition, the Coordinator-General may make recommendations about other approvals required for the Project under the *Integrated Planning Act 1997* (IP Act), and may state conditions to be attached to the approvals under the IP Act. The public notification period under the EIS process is taken to fulfil the referral and notification stages for certain development applications under the IP Act. This means that no further information requests or public notification under the IP Act will be required for certain development applications under the IP Act after completion of the EIS.

Table 1 provides a list of the key approvals required for the Project and the responsible authority for each approval. Further details of the approvals required for the Project are provided in each volume.

**Table 1: Summary of Legal Framework and Decision-Making Authorities**

Approval source	Decision maker	Relevant aspect of Project
<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)</p> <p>The Commonwealth Minister for the Environment, Heritage and the Arts decided the Project constitutes a controlled action under relevant controlling provisions of the EPBC Act.</p>	Commonwealth Minister for the Environment, Heritage, and the Arts	Any aspect of the Project which is likely to impact on a relevant matter of national environmental significance.
<p><i>Native Title Act 1993</i> (Cth): s 29 Right to Negotiate process</p>	National Native Title Tribunal	Agreement will need to be reached with the Iman People No. 2 or the National Native Title Tribunal will determine whether the mining lease applications should be granted. In addition there may be other native title processes/approvals associated with infrastructure outside the MLA boundaries.
<p><i>Airports Act 1996</i> and <i>Civil Aviation Act 1988</i> (Cth)</p>	Commonwealth Minister for Infrastructure, Transport, Regional Development and Local Government	Compliance of any aviation facilities developed for the Project with legislation and standards. Different approvals will apply depending upon whether the facility constitutes an 'airport', 'aircraft landing area', 'licensed aerodrome' or other such facility.

Approval source	Decision maker	Relevant aspect of Project
<i>State Development and Public Works Organisation Act 1971</i> (Qld)	Coordinator-General	Report evaluating the EIS for the Project.
<i>Mineral Resources Act 1989</i> (Qld): Part 7	Minister for Mines and Energy	Granting of the Project's three mining lease applications: MLA 50229, MLA 50230, and MLA 50231.
<i>Environmental Protection Act 1994</i> (Qld): Chapter 5	Minister for Sustainability, Climate Change and Innovation	Carrying out an environmentally relevant activity which is a mining activity.
<i>Integrated Planning Act 1997</i> (Qld)	Dalby Regional Council	Development outside the MLAs where the development is 'assessable development' under schedule 8 of the <i>Integrated Planning Act 1997</i> (Qld) (to the extent it is not otherwise exempt or self-assessable under the Planning Scheme for Taroom Shire, 2006). Development which may be assessable under the Act includes: accommodation facilities; residential accommodation in Wandoan; proposed municipal waste facility; potential airstrip; wastewater treatment plant; and the water treatment plant in Wandoan.
<i>Building Act 1975</i> (Qld)	Dalby Regional Council	For building works off a mining lease (which is not otherwise made self-assessable building work or exempt development under schedule 2 and schedule 3 respectively of the Building Regulation 2006).
Development permit (material change of use for an environmentally relevant activity) under the <i>Integrated Planning Act 1997</i> (Qld) and/or the <i>Environmental Protection Act 1994</i> (Qld): Schedule 8, Part 1, Table 2-1	Chief Executive of the Environmental Protection Agency	Carrying out environmentally relevant activities listed in Schedule 1 of the Environmental Protection Regulation 1998 outside of the mining leases: <ul style="list-style-type: none"> <li>» ERA 15 Sewage treatment – a standard sewage treatment works</li> <li>» ERA 21 construction of a new transmission pipeline under a pipeline licence, or a petroleum activity (whether or not as a Level 1 environmentally relevant activity)</li> <li>» ERA 62 Concrete Batching – producing concrete or a concrete product by mixing cement, sand, rock, aggregate or other similar materials in works (including mobile works) having a design production capacity of more than 100t a year</li> <li>» ERA 75 (a) Waste disposal – operating a facility for— ... disposing of general waste or limited regulated waste.</li> </ul>
<i>Aboriginal Cultural Heritage Act 2003</i> (Qld): s 87	Chief Executive of the Department of Natural Resources and Water	Development of a cultural heritage management plan (CHMP) in consultation with the Iman People #2 has occurred for the MLAs. A CHMP will be developed for the gas and raw water supply pipeline areas (if selected) in consultation with the traditional owners.
<i>Transport Infrastructure Act 1994</i> : ss 50 and 54	Chief Executive of the Department of Main Roads	Approval is required for: <ul style="list-style-type: none"> <li>» Access to State-controlled roads.</li> <li>» Construction of intersection upgrades, water and gas supply pipelines traversing under the Leichhardt Highway or Jackson - Wandoan Road will require an Ancillary Works and Encroachment Permit.</li> </ul>

Approval source	Decision maker	Relevant aspect of Project
<i>Transport Infrastructure Act 1994</i> (Qld): s 255	Existing railway's manager	Connection of the Project rail spur to the Surat Basin Rail Line (or other existing railway line) may require the approval of the existing railway's manager.
<i>Nature Conservation Act 1992</i> (Qld): ss 88, 89, 97	Chief Executive of the Environmental Protection Agency	Approval for the following activities may be required: <ul style="list-style-type: none"> <li>» Relocation of protected animals.</li> <li>» Clearing protected plants.</li> <li>» Relocation of wildlife not protected under the Act but found in certain areas covered by conservation plans created and implemented under the Act.</li> </ul>
<i>Vegetation Management Act 1999</i>	Chief Executive of the Department of Natural Resources and Water	Clearing of remnant assessable vegetation for the Project where off a mining lease.
<i>Water Act 2000</i> (Qld): ss 206 and 266	Chief Executive of the Department of Natural Resources and Water	For the taking or interfering with the flow of water (including from a watercourse, overland flow or groundwater)  To selectively clear or disturb vegetation, place fill or excavate in a watercourse, (Riverine Protection Permit).
<i>Land Act 1994</i> (Qld): s 99	Chief Executive of the Department of Natural Resources and Water	Temporary closure and realignment of sections of various roads including the Jackson–Wandoan Road.
<i>Explosives Act 1999</i> (Qld): s 53 and <i>Explosives Regulation 2003</i> : s 29	Chief Inspector designated by the Chief Executive for the <i>Explosives Act 1999</i>	For the use, storage, transportation, manufacture, and possession of explosives.
<i>Petroleum and Gas (Production and Safety) Act 2004</i> (Qld): s 395 and Chapter 4, Part 2	Minister for Mines and Energy	The following approvals will be required for the gas pipeline (if selected): <ul style="list-style-type: none"> <li>» a pipeline licence</li> <li>» Possibly a survey licence to enter an area to investigate possible pipeline routes, or otherwise investigate and survey an area's potential and suitability for the construction and operation of a pipeline.</li> </ul>
Development permit (operational works) under the <i>Integrated Planning Act 1997</i> (Qld), <i>Fisheries Act 1994</i> (Qld): Schedule 8, Part 1, Table 4-6 s	Chief Executive of the Department of Primary Industries and Fisheries	Development permits for operational works, that is, the construction or raising of a waterway barrier works for the following Project components: <ul style="list-style-type: none"> <li>» diversion of a number of creeks</li> <li>» road construction across watercourses, including for general access roads and haul roads</li> <li>» construction of conveyors.</li> </ul>
<i>Local Government Act 1993</i> and <i>Taroom Shire Local Law No. 21</i> (Roads): Part 3	Chief Executive of the Dalby Regional Council	A licence under the local law may be required for alterations or improvements to the local government roads.



## 6 PROJECT NEED AND JUSTIFICATION

With high world demand for good quality thermal coal forecast to continue, the Queensland coal industry (and specifically coals from the Surat Basin) are well placed to meet the continued export demand. Queensland coal producers, which include the WJV, are recognised as being among the world's lowest cost producers, further enhancing the long term market prospects for this Project.

The operation of the Project will make a substantial contribution to the social and economic environment of the region surrounding the Project area by revitalising the local economy and acting as a catalyst to increase and improve available local infrastructure services. Investment in port and rail development in the region, will significantly increase regional and state employment opportunities.

Population in the Wandoan district has fallen 25% since 2001, due to the drought and other factors. This Project will provide up to approximately 1375 jobs during the construction phase, and up to 844 jobs during the operations phase, including a regular intermittent maintenance/shutdown crew of 90 people. In order to maximise local employment and training opportunities, the WJV proposes to develop, in consultation with relevant government agencies and schools, a local employment and training policy for the provision of apprenticeships/traineeships for local youth and school based training. In addition, the WJV proposes to implement a tendering process for construction and operation supplies and services to encourage participation by local business, as well as a Business and Employment Register to enable inclusion of local and regional businesses in the Project.

The Project will provide significant direct (construction activities supporting mine development, trades, landscaping, engineering and suppliers), indirect (mine service industries) and induced (property, business services, accommodation, cafes, restaurants and retail trade) flow-on economic benefits on a regional, state and national scale. This in turn is expected

to lead to improved prosperity as incomes, employment and demand for goods and services increase during the life of the Project.

The WJV has committed to the following local infrastructure improvements, subject to agreement between the WJV and Dalby Regional Council:

- » assisting council to develop a public airstrip near the Wandoan township or upgrade of the Taroom aerodrome, which will provide the opportunity for improved access to other major centres, employment opportunities, social activities and emergency services
- » assisting Dalby Regional Council develop a new multi-user municipal waste and recycling facility for the Wandoan area to be owned and managed by Council
- » upgrading the Wandoan potable water treatment facility, including development of a new cooling tower
- » upgrading the existing Wandoan wastewater treatment plant facilities to increase the performance of the existing facilities.

On a broader scale, the Project will also provide, in current values:

- » approximately \$3.7 billion of State coal royalty payments over the 30 year operation of the Project
- » approximately \$500 million in annual port and rail charges
- » annual rates contributions to local government
- » significant indirect benefits through the flow-on impacts from revenues associated with goods and services produced for the region, State and nation.

State royalty payments and local government contributions assist in funding a range of services to the benefit of the local community and the region.

If the Project does not proceed, there is potential for the on-going and demonstrated global demand for thermal coal to be lost to an international competitor. The consequences of not proceeding with the Project would be loss of the substantial economic contributions from loss of export revenue, royalties, local regional and state employment opportunities and beneficial flow on effects.

## 7 ALTERNATIVE OPTIONS

In development of the Wandoan Coal Project, a series of alternatives were examined for:

- » a range of mining methodologies
- » mining schedules
- » Run of Mine (ROM) coal handling, preparation and processing

- » product coal handling
- » product coal transportation
- » rejects and tailings disposal
- » disposal of general municipal waste
- » disposal of sewage
- » raw water supplies for construction and operations
- » power supply during construction
- » distribution of site power
- » energy use and efficiencies
- » accommodation options
- » methods to transport of the operations workforce
- » gas supply pipeline routes
- » operational raw water supply pipeline routes for each alternative.

The selection of the proposed development option for each component of the Project was made taking into account leading industry practices for construction and operation activities, energy efficiency opportunities, as well as regulatory, environmental, social, economic assessment criteria. Chapter 2 of each of the EIS volumes provides details on the alternative options examined for each of the Project components.

## 8 PROJECT DESCRIPTION

### 8.1 PROJECT CONSTRUCTION

As the commencement date for construction is dependent upon the timing of the Project approvals process, the EIS does not quote specific years for early works, construction and operation. The phasing of the Project is discussed in terms of early works commencing in Year -3, with the first year of construction being Year -2, second year of construction Year -1, followed by first year of operation as Year 1, then following operational years to Year 30. A description and indicative timing of the key Project phases is provided in Table 2.

**Table 2:** Indicative Project Timing

Year	Explanation	Indicative dates
Year -3	Early works	Aug-Dec 2009
Year -2	1st year of construction	2010
Year -1	2nd year of construction	2011
Year 1	Commencement of operations	2012



#### 8.1.1 CONSTRUCTION PROGRAM

Construction of Project infrastructure is expected to take approximately two years. The main components of the construction program include:

- » early works:
  - › design
  - › tenders/procurement
  - › off-MLA works
- » site preparation:
  - › site security
  - › site clearance, including vegetation clearance, topsoil removal and storage and temporary drainage works
  - › civil works.
- » construction:
  - › structure and plant erection and installation
  - › commissioning and testing
  - › site demobilisation and clearance of construction equipment and materials
  - › establishment of telecommunications requirements.

Some construction work on the mine site will continue during the initial years of mine operations, such as the extension of mining activities to the west of Mud Creek, which includes new dump stations and extension of the conveyor system.

#### 8.1.2 CONSTRUCTION WORKFORCE

For the mine construction, the total on-site workforce is expected to peak in the second year of construction at approximately 1,375 people.

For each of the CSM water supply and gas supply pipelines, up to 50 construction personnel may be required for approximately a nine month construction period. For the Glebe option of raw water supply, up to 50 construction personnel may be required for the pipeline construction,



and up to 40 people for the weir raising. The overall construction period for the Glebe Option is estimated to take approximately two years.

### 8.1.3 CONSTRUCTION WORKFORCE ACCOMMODATION

To minimise the potential impact on local accommodation, the WJV will develop permanent, fully serviced accommodation facilities adjacent to the proposed MLA areas for the workforce. It is expected that a small percentage of personnel will make their own accommodation arrangements, particularly couples. Accommodation units will be single ensuite units, suitable for either male or female personnel.

While the peak construction workforce is estimated at 1,375, the accommodation facilities will cater for up to 1,425 personnel to include some operational personnel likely to be present during the transition from construction phase to operation phase.

The accommodation facilities will be re-configured during the latter phases of construction with permanent motel-style facilities to cater for the likely permanent workforce of around 500 in Year 1, to around 844 by Year 4 (both figures include provision for a regular intermittent maintenance/shutdown crew of around 90 people).

It is proposed that the workforce for the raw water and gas supply pipeline options will stay in identified local caravan parks, motels, or a temporary accommodation facility for the duration of the construction period. Personnel will be transported to site from these locations by buses prior to and at the end of each shift. The WJV has consulted with Dalby Regional Council in relation to early works accommodation requirements, and will continue to consult with local property owners and Dalby Regional Council. SunWater is consulting with Banana Shire Council for the Glebe Option, in relation to temporary construction accommodation arrangements.

If selected as the raw water supply option, the Glebe Option construction workforce will be temporarily accommodated in Taroom (for the weir raising) and Wandoan (for the southern section of the pipeline), which is expected

to increase local economic benefits during the construction period for these towns.

In terms of potential cumulative impacts on local accommodation, demand for housing accommodation during construction may increase demand for rental properties, particularly during early works prior to establishment of the accommodation facilities for the Project. However, the social economic impact assessment shows that the current vacancy rate in Wandoan is 30% (Taroom is 27%), which suggests an availability of local rental accommodation. In addition, demand for rental properties will likely stabilise following completion of the accommodation facilities. Given the limited duration of demand, any accommodation requirements for construction will be met by specific construction accommodation facilities, rather than place sustained demand on existing rental housing stock.

### 8.1.4 MATERIALS, PLANT AND EQUIPMENT SOURCING

Large and over-size loads are anticipated, particularly during the coal handling preparation plant (CHPP), dump station, stacker/reclaimer, dragline and heavy mining equipment erection and installation phases. Loads will mostly be hauled from either the Port of Brisbane or the Port of Gladstone, with some loads requiring an escort. Where possible, consideration will be given to the timing of such transportation to minimise disruption to other road users.

Construction traffic will involve rigid and articulated vehicles, and light goods vehicles. Traffic flows and vehicles types are expected to vary over the construction period, reflecting the types of materials and equipment required at a specific time.

Pipes for raw water and gas supply will likely be sourced through Brisbane or South East Queensland for road transport to the selected pipeline alignment.

The WJV will manage construction traffic to ensure the safety of public and construction workers as well as minimise disruptions as far as practicable through the development of a Traffic Management Plan, in consultation with the Department of Main Roads and Dalby Regional Council.

### 8.1.5 WATER SUPPLY

#### Potable Water Supply

The potable water demands for the Project have been estimated for the site based construction and operational requirements, taking into consideration the demand due to the expected population increase in the Wandoan town, including the accommodation facilities.

Potable water demand peaks for the Project in the second year of construction at approximately 168 ML per annum, which when included with the town's current usage, is within the current allocation from the Great Artesian Basin (GAB) for the Wandoan Town Water Supply.

Subject to agreement with Dalby Regional Council, the WJV will upgrade the Town's potable water supply treatment facilities, including a new water cooling tower, to meet the Project's construction and operational demands for potable water.

### Construction Raw Water Supply

During the two year construction period for the mine, approximately 350 ML per annum construction raw water excluding potable water, will be required for dust suppression, earthworks and concrete mixing. The following options for delivery of raw water during construction have been investigated as part of the impact assessment:

- » use of an existing Hutton Sandstone GAB bore on land owned by the WJV for the two year construction phase only, which will require a permit from the Department of Natural Resources and Water
- » existing surface water dams and bores in the coal seams
- » use of the upgraded Wandoan Town Bores.

While all options have been demonstrated to be viable, the supply source selected for construction may involve one or a combination of these options.

Raw water for use in the construction of either the CSM water supply pipelines or Glebe Option is expected to be minimal, with the main requirement expected to be in pipeline commissioning.

## 8.2 OPERATIONS

### 8.2.1 MLA AREAS

The MLA areas comprise a number of open-cut pits, varying in area and depth, that will be mined using dragline, and truck and excavator equipment. The coal will be crushed, processed and blended on site before being transported by rail to Gladstone for export.

The key features of the Project within the MLA areas are proposed to comprise:

- » during the construction phase, initial mining of 500,000 tonnes of ROM coal for testing and commissioning purposes
- » open-cut mining of thermal coal on Mining Lease Applications (MLAs) 50229, 50230 and 50231, at a rate of around 30 Mt/a ROM coal
- » in-situ coal resource identified within the Juandah Coal Measures of these MLAs is estimated to be in excess of 1.2 billion tonnes of thermal coal, of which approximately 500 Mt has a ROM strip ratio of less than 3:1, with the remainder of the coal typically being in the range of 3:1 to 5:1 strip ratio
- » fifteen pits are anticipated for development over the 30 year period of the mine. Generally each pit will be mined 24 hours a day, seven days a week, with the



- possible exception of Frank Creek Pit and potentially Leichhardt Pit, subject to the Environmental Authority conditions
- » up to five draglines anticipated to be in operation at any one time over the 30 year operation of the mine lease
- » coal conveyance, washing and load-out using coal handling and preparation plant:
  - » washing of the ROM coal to form product coal will be conducted via the Coal Processing Plant (CPP), which is proposed to operate 24 hours a day, seven days a week
  - » the CPP will include three modules that process the ROM coal into washed product coal, coarse rejects and tailings. Sufficient space will be allowed for a fourth CPP module that will allow for increased coal processing to over 30 million tonnes per year in the event that production is to be expanded in the future. Each module will be approximately four storeys high
- » export of around 22 Mt/a of product coal from the site via two product coal stockpiles and a rail spur of approximately 8 km connecting to the proposed Surat Basin Rail
- » coarse rejects waste placement within Austinvale Pit
- » tailings disposal will initially be in a tailings starter dam. Austinvale Pit North will be mined out during Year 1, and then used for tailings disposal for approximately 8 years. Tailings disposal will be to Austinvale Pit for the remaining duration of the Project. Use of mined pit for tailings disposal reduces the environmental footprint and does not sterilise a potential coal resource
- » raw water will be reticulated around the site from a 400ML raw water storage dam, for use in coal handling and washing, and supply to the Mine Infrastructure Area, and dust suppression

- » site water management, including tailings dams, creek diversions, levees, sediment dams, environmental dams, and pit voids
- » proposed Mine Infrastructure Area (MIA) including administration and bathhouse facilities, vehicle parking, fuel storage and handling, lube and oil storage facility, heavy- and light-vehicle washdown facilities, services reticulation, workshop and store, and laydown areas. Figure 9 provides an indicative image of the MIA
- » security building at the mine site entrance and exit point
- » dragline construction facilities, including workshop, store and maintenance facility to service dragline erection and maintenance
- » low-voltage and high-voltage power reticulation throughout the mine, and accommodation facilities
- » progressive closure and relocation of the existing local power supply infrastructure
- » road construction, including light-vehicle access roads, heavy-vehicle haul roads and a site access road. The intersection between the site access road and the Leichhardt Highway will be developed by the WJV as part of its bulk sample works and is not the subject of this EIS.

#### Frank Creek Pit

One of the fifteen pits, Frank Creek Pit, is the closest pit to the Wandoan township. To limit the potential impacts on the township, the use of a dragline in Frank Creek will be restricted, where necessary, if monitoring of weather conditions, air quality, noise and blasting indicate that the conditions in the Environmental Authority will not be met.

#### 8.2.2 TEMPORARY ROAD CLOSURES AND REALIGNMENTS

The Project will result in a number of temporary road closures and realignments of local roads and the Wandoan-Jackson Road within and adjacent to the MLA areas. Roads will be constructed to Department of Main Roads' and Dalby Regional Council's standards, and appropriate traffic management measures will be employed during the construction of these roads. Proposed road closures and realignments include:

##### Year -1

- » Q Road - closure
- » southern end of Grosmont Road from Wandoan-Jackson Road to Wollebee Creek - closure.

##### Year 2:

- » Jackson-Wandoan Road and stockroute - 12.4 km section will be closed requiring a diversion along Peakes Road and the southern boundary of MLA 50230 to be constructed during Year 1

- » Bundi Road - realignment to direct Bundi Road onto the Jackson-Wandoan Road diversion, with construction during Year 1
- » Paradise Downs Road - temporary partial closure of northern end of Paradise Downs Road.

##### Year 4:

- » Booral Road - temporary partial closure from Grosmont Road to the west of the intersection with Kabunga Road and realignment at intersection of Grosmont Road.

##### Year 8:

- » Kabunga, Ryals and Cecils Roads - partial closure and realignment of the roads, with approximately 17km of new alignment from the Kabunga Road at the intersection with the northern MLA 50229 boundary, running west inside the MLA boundary before turning south at the intersection with Ryals Road, and then south-east across to intersect Cecils Road.

The proposed temporary road closures and relocation alignments are subject to detailed design and consultation with the Department of Main Roads, the Dalby Regional Council and the Department of Natural Resources and Water.

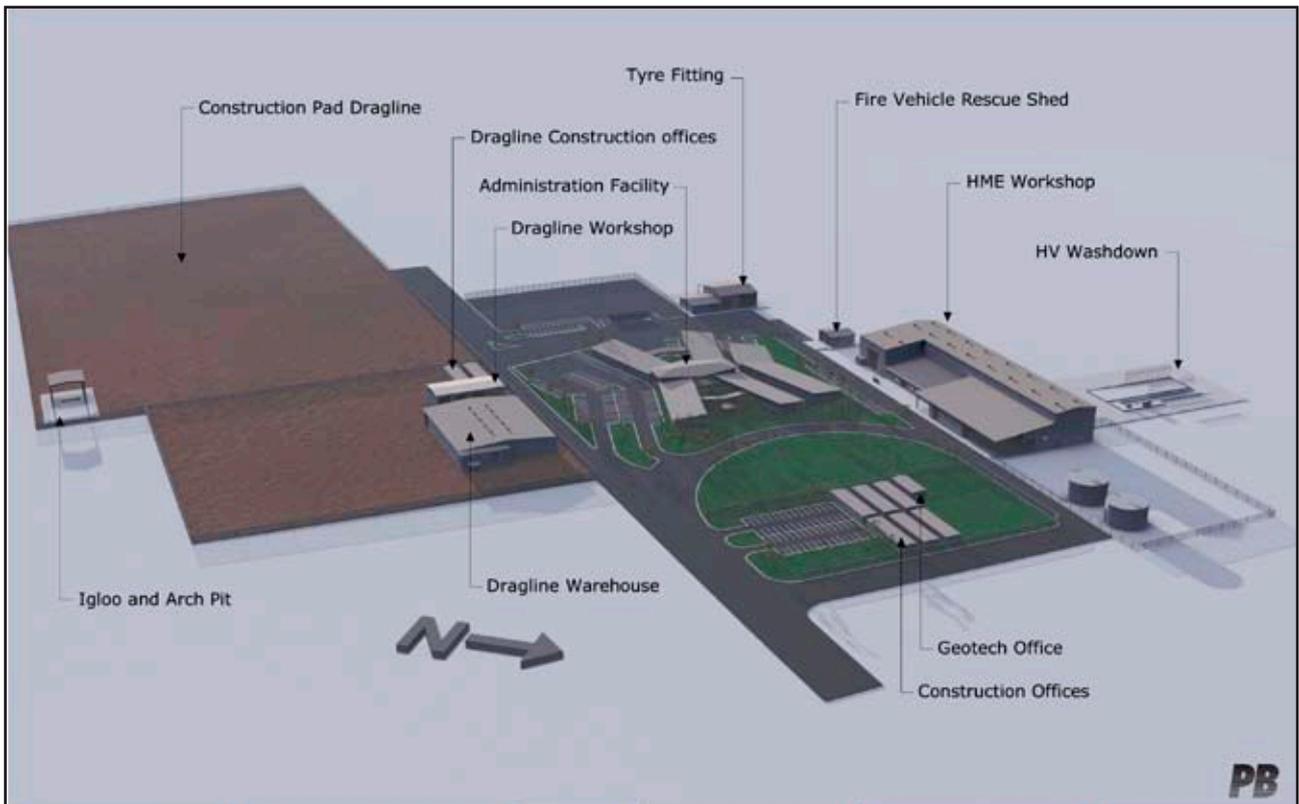
A stockroute is associated with the Wandoan-Jackson Road and will be re-established with the road relocation following consultation with Dalby Regional Council and Main Roads.

#### 8.2.3 INFRASTRUCTURE OUTSIDE THE MLA AREAS

Infrastructure outside the MLA areas include various components of the Project that will contribute to the efficient functioning of the mine.

Key infrastructure of the Project outside the MLA areas includes:

- » operational raw water supply for coal washing and other requirements by one of three potential options:
  - » coal seam methane (CSM) by-product water from south of the MLA areas (see Volume 2)
  - » CSM by-product water from west of the MLA areas (see Volume 3)
  - » surface water from the raising of Glebe Weir on the Dawson River (see Volume 4).
- » upgrading the existing Wandoan town potable water treatment facilities and a pipeline to the MLA areas
- » accommodation facilities
- » upgrading the existing Wandoan town wastewater treatment facilities to allow for discharge of municipal wastewater from the mine and accommodation facilities, in consultation with Dalby Regional Council



**Figure 9: Mine Infrastructure Area**

- » town-based accommodation, with the WJV providing 15 houses and 10 two-bedroom duplexes (or equivalent) for its staff in Wandoan, with housing for a total of 35 personnel.
- » transportation of the mine workforce by one of three options:
  - › potential new public airstrip at Wandoan, which will allow for fly-in and fly-out of the mine operations workforce, on a site to be determined on or adjacent to the MLA areas, and subject to ongoing consultation with Dalby Regional Council. The airstrip will be the subject of separate siting, assessment and approvals processes; or
  - › upgrade of the existing Taroom Aerodrome, which will allow for fly-in and fly-out of the mine operations workforce; or
  - › bus transportation from major centres (such as Brisbane).
- » municipal waste facilities, on a site to be determined adjacent to the MLA areas (or alternative disposal at an existing licensed waste facility). Municipal waste disposal is subject to ongoing consultation with Dalby Regional Council, and would be the subject of separate siting, assessment and approvals processes
- » power supply for the mine by one of four potential options:
  - › total site supply by a 275 kV electricity transmission line, including substation; or
  - › total site supply by a 132-kV electricity transmission line, including substation; or
  - › a baseload total-site-supply, on-site gas-fired power generation of 80 MWe gross electric output, including gas supply pipeline from the Peat-Scotia lateral gas pipeline; or
  - › a partial-site-supply, on-site gas-fired power generation of 30-MWe gross electric output, including gas supply pipeline from the Peat-Scotia lateral gas pipeline. Remaining power would be supplied by a 132 kV electricity transmission line.

Depending upon which power supply option is chosen, a transmission line may only supply the WJV for its Project requirements, or it may supply multiple users, including the WJV. As the preferred option has not been selected, no impact assessment has been undertaken for the transmission line power supply options. If required, an environmental assessment of a transmission line will be provided as a separate stage of the EIS.

**Operational Raw Water Supply**

Operational raw water will be required for the CHPP process water, fire fighting services, site dust control, and vehicle washdown. It is anticipated that demand will be around 8,400ML by Year 5, with peak demand estimated to be around 9,100ML per annum in Year 15.

Three separate raw water supply options have been assessed as part of the EIS:

» **Option 1 - Southern Coal Seam Methane (CSM) Water Supply Pipeline (Volume 2 of the EIS)**

If selected as the preferred raw water supply, the proposed southern CSM water supply pipeline will be approximately 93 km long, taken from an intake point adjacent to the Condamine Power Station, delivered to the raw water storage dam on the MLA areas. The pipeline will be buried, with a pipeline easement of up to 20m wide, with a single pump station located at the intake point.

» **Option 2 - Western Coal Seam Methane (CSM) Water Supply Pipeline (Volume 3 of the EIS)**

If selected as the preferred raw water supply, the proposed western CSM water supply pipeline will be approximately 91 km long, from a collection pond adjacent to the Spring Gully Reverse Osmosis (RO) Plant to the raw water storage dam on the MLA areas. The pipeline will be buried in a corridor approximately 20 m wide, with a single pump station located adjacent to the Reverse Osmosis Plant.

» **Option 3 - Glebe Weir Option (Volume 4 of the EIS)**

If selected as the preferred raw water supply, SunWater proposes to increase the maximum storage capacity of the existing Glebe Weir from 17,700 ML to 30,100 ML. This will be achieved by fitting inflatable rubber dams (fabridams) across the existing structure to raise the weir full supply level (FSL) by 2.36 m to 172.9 m Australian Height Datum (AHD). This will require widening and extension of the existing weir spillway crest and abutments.

The weir raising will include a range of other components, including

- › earth levees on both sides of the weir structure to contain the storage at FSL
- › construction of a control building
- › provision for a future fishway and multi-level offtake
- › construction of balancing storage tank.

Volume 4 of the EIS proposes a design for the raising of Glebe Weir that utilises an inflatable fabridam to increase the height of both the spillway and the abutments. Fabridams are a mechanism commonly used throughout Australia and the world to augment the capacity of existing water storages.

Immediately prior to the release of this EIS, an incident involving a fabridam occurred on Bedford Weir, another SunWater storage located on the Mackenzie River, which utilises a fabridam in a similar nature to that proposed for the Glebe Weir raising.

The Glebe design will be reviewed in light of the findings from investigations into the Bedford incident and alternative options for raising Glebe Weir may be assessed. An alternative may include the replacement of the fabridams with collapsible steel shutters which are operated in a similar manner to fabridams. This design has been utilised by SunWater on two other water storages, these being Clare Weir on the Burdekin River, and Ben Anderson Barrage on the Burnett River.

Should SunWater decide to replace the fabridam option with an alternative such as steel shutters, the weir will be raised to an identical height to that currently outlined in the EIS. Subsequently whilst some minor changes may occur in relation to the construction process, the vast majority of impacts outlined in the EIS will remain unchanged.

For the Glebe option, approximately 83 km pipeline from Glebe Weir will commence at a pumping station on the bank of Cockatoo Creek near its confluence with the Dawson River, upstream of the weir structure. A 30 m wide construction easement for the pipeline will run east across private property for approximately 11 km to join the Nathan Road reserve. From there, it will primarily follow the Nathan Road reserve. A single balancing storage is proposed at a high point along Nathan Road.

#### 8.2.4 SUSTAINABILITY

The WJV makes the following commitments to reduce the mine's environmental footprint, promote energy efficiency and minimise water demand and usage:

- » The layout of the mine (including haul truck routing, pit access ramps and haul roads and location of ROM and overburden dumps) has been designed to minimise diesel consumption and maximise energy efficiency of operations.
- » Progressive disposal of coarse and fine rejects into the voids of already mined pits will be undertaken to provide an effective long term rejects storage option that does not sterilise future coal reserves, and allow for a reduced environmental footprint.
- » The area of disturbed land at any one time will be minimised as far as practicable through planning and staged development.
- » Progressive rehabilitation will be undertaken over the life of the mine to minimise the cleared footprint of the mine at any one time.
- » A monitoring and maintenance program will be implemented to ensure continued efficiency of mining equipment.
- » An energy efficiency audit will be undertaken during the detailed design phase (where appropriate), as well as the investigation and implementation of:
  - › high efficiency electrical motors throughout the mine site and the use of variable speed drive pumps with

high-efficiency linings at the coal handling and preparation plant

- › light-sensitive switches on lighting equipment and energy efficient lightbulbs where practicable
- › installation of energy saving devices will be undertaken within the MIA buildings and accommodation facilities, where practicable.

In developing the accommodation facilities, the WJV will use leading industry practice in terms of sustainability and energy efficiency, including design maximising air flow, shading and beneficial landscaping, use of energy efficient (eg. Solar) hotwater systems, water saving devices and energy efficiency lighting. The WJV has committed to investigating and implementing, where practicable, roof-mounted solar hot water systems, rainwater capture and beneficial reuse of grey water associated with the accommodation facilities. The design of the accommodation facilities will also take into account relevant guidelines such as the Queensland Government's Improving Sustainable Housing in Queensland Discussion Paper (June 2008), which proposes measure to reduce the environmental impact of Queensland homes.

The WJV is investigating renewable energy sources for components of the Project, such as the accommodation facilities. This may include on site solar generation.

The Water Management System has been designed to incorporate recirculation and recycling of process water throughout the Coal Processing Plant to minimise demand for raw water supply. Recycled raw water will be beneficially reused in the coal processing plant and dust suppression (where adopted water quality criteria are met). Volume 1, Chapter 6 describes energy efficiency and sustainability measures to be considered during Project development.

In terms of raw water supply for mining operations, the WJV initially assessed the use of water from the Great Artesian Basin (GAB), and determined that this option was not sustainable. Three other separate, viable options were identified, and have been included as part of the impact assessment. For each of the three raw water supply options, a range of pipeline routes, including potential co-location opportunities with existing and proposed infrastructure, and supply methods were considered. The three water supply options are assessed in Volumes 2, 3 and 4 of the EIS.

To mitigate impacts on terrestrial ecology, a Biodiversity Offsets Strategy will be developed in consultation with the Environment Protection Agency and the Commonwealth Department of the Environment, Water, Heritage and the Arts.

## 9 CONSULTATION PROCESS

The WJV has conducted a comprehensive community consultation program to raise awareness and ensure an open and transparent interactive communication process between the community, potentially affected property owners, key stakeholders, and the Project team. This also included consultation with affected landowners for the two CSM water supply pipelines and gas supply pipeline.

Key elements of the consultation program included:

- › developing Project-specific communication materials such as advertisements, newsletters, and information sheets
- › conducting an affected property owner's forum
- › conducting community information workshops in the townships of Wandoan, Taroom and Miles
- › establishing a Community Reference Group and conducting quarterly meetings
- › contacting and meeting with potentially affected property owners
- › specific bulk sample operations consultation
- › maintaining community contact points
- › development of a cultural heritage management plan in consultation with the Iman People #2
- › meeting with elected representatives and government stakeholders.

In addition, SunWater undertook a separate, targeted consultation program with landowners and other key stakeholders for the Glebe Option.

From the community consultation process to date, the most common issues raised related to compensation, the valuation process, Project water supply, proposed mine plans, environmental impacts, amenity impacts and social impacts. There was recognition that the Project had the potential to provide future benefits to the community, including upgrades to services and infrastructure, greater employment and business opportunities, increased populations and the opportunity for the townships to prosper.

The WJV and SunWater have developed a range of commitments to address the issues and concerns raised by the community, and will continue to provide focused information for affected property owners.

Overall, the Project recognises the important sense of community, sense of security, participation in community events, and the volunteer mentality. The WJV aims to embrace, encourage and enhance these aspects of the community.

Key commitments to social sustainability for the local community and region are outlined in section 11 below.

Section 11 outlines the key commitments to the Traditional Owners for the Project.

## 10 IMPACT ASSESSMENT

### 10.1 METHODOLOGY

The impact assessment methodology used is a systematic analysis of the proposed development in relation to the existing environment. The overall methodology used in the preparation of the EIS is:

- » establish a basis of assessment
- » conduct impact assessment and nominate mitigation measures
- » establish the significance of environmental issues.

### 10.2 LAND USE AND TENURE

#### 10.2.1 MLA AREAS

The three MLA areas cover a total area of approximately 32,000 ha, of which approximately one third has been acquired by the WJV (as at the date of this EIS). Most of this land and surrounding lands is currently used for agricultural purposes. Wandoan township is located immediately east of the Leichhardt Highway and the eastern boundary of MLA 50230.

Tenure of the land is generally freehold, with some leasehold properties, reserves, unallocated state land and other tenures (licences and permits to occupy).

The WJV will seek to purchase or reach a compensation agreement with all landowners within the MLA areas prior to commencing construction and operations.

The WJV commitment to open and fair negotiations for land acquisition is outlined in section 10.17 below

#### 10.2.2 RAW WATER SUPPLY PIPELINE OPTIONS AND GAS SUPPLY PIPELINE

Most of the land required for the proposed southern and western CSM water supply and gas supply pipelines is currently used for agricultural purposes or is within road reserves. Access to the pipelines will be required for maintenance purposes over the lifetime of the mine.

The likely impacts of the proposed pipeline options on land uses are expected to be limited to the construction phase. Pipeline impacts on land use will be negligible during the operational phase, and generally associated with routine pipeline maintenance only.

#### 10.2.3 GLEBE WEIR RAISING

The majority of land impacted by the area of inundation associated with the Glebe Option will be State owned land, due to the flooding of Boggomoss Creek and Cockatoo Creek. The latter has been minimised by the inclusion of levees. For three of the four parcels in private ownership,



impacts are restricted to increases in the length of bed and banks inundated by the storage. For the remaining property, the impact relates mainly to flooding of 150 ha of land near Cockatoo Creek.

Approximately 80% of the proposed Glebe pipeline route is within existing road reserves, with easement negotiations to be held with landholders where the route crosses private property. A balancing storage is proposed to be acquired at a high point along the pipeline route and the owner is amenable to the proposed acquisition.

### 10.3 GEOLOGY, MINERAL RESOURCES, OVERBURDEN AND SOILS

#### 10.3.1 MLA AREAS

##### Geology and Mineral Resources

The Juandah Coal Measures contain the economic coal reserves of the Project. The coal seams are relatively flat, with a regional dip of approximately zero to two degrees to the south-west, with localised steeper dips. Exploration drilling has identified the following seam groups:

- » Kogan
- » Macalister Upper
- » Macalister Lower
- » Wambo

Geological models have been generated to enable estimation of Australasian Joint Ore Reserves Committee (JORC) compliant resources for Mineral Development Licences MDL 221 and MDL 222 within the Juandah Coal Measures. MDL 221 underlies MLAs 50230 and 50231, while MDL 222 underlies MLA 50229.

##### Overburden and interburden

Overburden is the material overlying the shallowest coal seam and interburden is the material between economic coal seams.

Overburden consists mostly of sandstone, siltstone, mudstone, claystone and coal, with minor ironstone. Rock strength is typically low, increasing in strength with depth up to medium and high. Overburden samples tested were found to have a low sulphur content, with minor or no acid rock drainage potential.

Clay rich, slake prone rocks are present throughout the overburden and interburden deposits, although siltstone and mudstone resistant to slaking was encountered during assessment. Material prone to slaking is also present in the proposed pit floors. Erosion results from slaking and dispersion. Slaking is the breakdown of a material's structure when exposed to water. Dispersion is the transformation of a solid material into a colloid when in contact with water.

The overburden has very low organic matter and nitrogen content. The pH of overburden was found generally to be alkaline. There is a potential for fossilised material to be discovered during drilling, excavation and mining activities.

Overburden will generally be removed by dragline operations and progressively placed in the preceding strip void. Overburden dumps will be levelled out and shaped to provide a gently undulating landform similar to the existing topography. The overburden is prone to dispersion and is generally unsuitable as a growth medium. The overburden will be carefully managed in order to mitigate the dispersion impacts. To address the unsuitability as a growth medium, overburden will be capped with subsoil and topsoil prior to revegetation.

#### Soils

Eight soil types were identified within the MLA areas, including cracking and non-cracking clays on the undulating hills and uniform and texture contrast soils on the floodplain. Subsoils over much of the MLA areas are alkaline, sodic and dispersive. Stripping, storage and reuse of topsoils will be undertaken as part of topsoil management and site rehabilitation.

Potentially impacted soils will be protected through preparation and implementation of management plans for erosion, salinity, compaction and topsoil reuse.

Proposed measures to manage erosion of soils, include reinstating any soil conservation measures, installing erosion and sediment control measures on disturbed natural or constructed slopes, and minimising slopes and amount of areas cleared. Other mitigation involves avoidance of saline soils for topsoil use, selection of appropriate machinery, water and sediment controls to minimise compaction, and appropriate stockpiling, including planting vegetation on stockpiles and choice of topsoils.

Currently, the MLA areas and surrounding lands are predominantly used for agricultural purposes, such as cropping and grazing.

#### GQAL

The GQAL distribution of Good Quality Agricultural Land (GQAL) under the Taroom Shire Planning Scheme shows that all land within the MLA areas can be classed as GQAL. Based on the findings of the land suitability assessment undertaken for this Project, the distribution of GQAL differs to that under the



Planning Scheme, with Class B agricultural land considered to be a more appropriate classification for the lower slopes, and the floodplains and upper slopes being Class A, as shown by land suitability Class 4 and 3 respectively.

The mine will result in a reduction in Class 3 cropping land and Class 2 cattle grazing land. The post mining land suitability classes proposed to be established for the Project are, where appropriate:

- » undisturbed land returned to (or retained in) its pre-mining land suitability class
- » land used for infrastructure components of the Project (e.g. roads and MIA) will where practicable be returned to Class 3 cropping land or Class 2 grazing land
- » flatter gradient sections of overburden stockpiles and tailing dam sites will, where practicable, be returned to Class 3 cropping land or Class 2 grazing land. Steeper gradient overburden stockpile slopes will be used for nature conservation
- » final voids will be unsuitable for agricultural use being Class 5 for cropping and cattle grazing, and will be investigated for alternative beneficial uses such as wetlands.

#### 10.3.2 RAW WATER AND GAS SUPPLY OPTIONS

Soils north of the Great Dividing Range along both of the proposed water supply pipelines and gas supply pipeline include cracking and non-cracking clays on the undulating hills north of the Great Dividing Range, and sandy to loamy texture contrast soils on and south of the range. Floodplain soils south of the range also comprise sandy to loamy soil. The soils with sandy to loamy topsoil will be highly susceptible to wind and water erosion following disturbance, and the area of these soils cleared or disturbed for works will be minimised, and suitable erosion and sediment control measures implemented.

Soils north of the Great Dividing Range along the proposed water supply pipelines and gas supply pipeline are typically classified as Good Quality Agricultural Land (GQAL), while most land on and south of the Great Dividing Range is not GQAL, with the exception of the floodplain of Eleven Mile Creek.

During pipeline construction, topsoil will be stripped separately to subsoils, and will be stockpiled and respread over the disturbed area following construction. Where applicable, the land surface will be left in a smooth even grade suitable for agricultural use, and sodic or acidic subsoils will be buried below the rooting depth of crops. Pipelines should have minimal impact to existing agricultural use of the land, with some limitations at sites of ancillary infrastructure elements, such as valves and signs, and some restrictions relating to the siting of potential future farm infrastructure such as sheds and irrigation equipment.

### 10.3.3 GLEBE WEIR RAISING

All the area directly affected by the Glebe Option is within the rural zone of the Taroom Shire Planning Scheme. Raising Glebe Weir will inundate 770 ha of predominantly Class A (cropping land) and 150 ha of Class C (grazing land). In the context of the national, State and local economic benefits created from the weir raising, the economic impact of loss of agricultural land is minor.

The Dawson River streambed and banks immediately downstream of Glebe Weir are stable at present and should remain so after the full supply level is raised.

The geological conditions of the area should not affect the raising of the weir and pipeline construction, as the existing weir shows no evidence of leakage below or around the structure and the few exposed rock areas (road cuttings) adjacent to the pipeline route, indicate that it should be possible to excavate the pipeline trench without the need for blasting.

Areas that are disturbed from pipeline construction will be protected and rehabilitated to prevent long-term landscape instability.



## 10.4 GROUNDWATER

### 10.4.1 MLA AREAS AND PIPELINE OPTIONS

Out of the four locations identified and drilled for pump testing in the initial pits of the MLA areas, only one site produced sufficient quantities of water to warrant construction of a production/test pumping bore. The other locations produced

minimal groundwater. Generally, the groundwater investigations indicate that there are limited quantities of coal seam water in the study area, and that coal seam water is generally only suitable for industrial and agricultural uses. The investigations also confirmed that groundwater is abstracted from the Great Artesian Basin for various uses in and around the MLA areas.

The potential effects of mining on coal seam groundwater users was determined to be limited to approximately 20 bores outside of the MLA areas. It is proposed to carry out further groundwater investigations and assessment as the Project design develops to confirm whether there is a potential to adversely impact these users.

Deep bores (>600 m) extracting water from the GAB were deemed not to be impacted to due to significant depth of separation and presence of impermeable strata between the mine operations and these aquifers.

The WJV will ensure continued access and supply of groundwater from community or other multi-user bores for users within the area surrounding the MLA areas. If any unacceptable impacts on those groundwater bores are experienced, the WJV will make good any water losses caused as a direct result of mining activities in consultation with any impacted users. Such measures may include establishing new bores, deepening existing bores or providing alternative water supply.

The pipeline trenches will be up to 1.5 m deep, for the proposed gas pipeline. There is likely to be a minimal amount of groundwater encountered during the installation of any pipeline through shallow alluvial aquifers. It is unlikely there will be any residual groundwater impacts to the pipeline areas after construction.

Overall, the Project is expected to have negligible impacts on users and environmental values of groundwater from Great Artesian Basin and sub-artesian bores.

### 10.4.2 GLEBE WEIR RAISING

The impact assessment identified a risk of potential waterlogging of land immediately adjacent to the levee proposed to be constructed on the left bank of the Dawson River near Boggomoss Creek, as a result of the proposed weir raising.

In the area of Boggomoss Creek, there is a series of springs ("boggomosses") that discharge from the Precipice Sandstone up through fault pathways in the overlying Evergreen Formation into alluvium. Boggomoss No. 8, one of the known homes to the Boggomoss Snail, is located almost 1 km from this levee so is unlikely to be impacted by any increased waterlogging. The alignment of the proposed levee bank has been designed to exclude boggomosses from the impoundment area.

While unmitigated risks from waterlogging to Boggomoss no. 8 are estimated to be low, proposed mitigation strategies will further

prevent any waterlogging. In addition, a monitoring program is proposed that will be able to identify if any changes in groundwater levels do occur. The mitigation program will ensure that Boggomoss no. 8 is not impacted, so the mitigated risk is nil.

## 10.5 WATER SUPPLY AND MANAGEMENT

### 10.5.1 MLA AREAS

The Project is located in the southern portion of the Fitzroy River drainage basin, in the upper catchment of the Dawson River, a tributary of the Fitzroy River.

Juandah Creek, the most prominent watercourse in the study area, flows north to the Dawson River, 64 km north of the MLA areas. The greater Juandah catchment is largely undulating with some isolated rocky peaks to elevations above RL 490 m. Most of the catchment is cleared for grazing, with forested areas in the steeper upper catchment on the slopes of the Great Dividing Range. The major creeks include:

- » Spring Creek and Mud Creek (MLA 50229)
- » Halfway Creek, Frank Creek, Two Mile Creek and Juandah Creek (MLA 50230)
- » Blackant Creek, Wandoan Creek and Woleebee Creek (MLA 50231).
- » Stakeyard Creek, Roche Creek and Juandah Creek (gas supply pipeline)

Approximately 83% of the MLA areas drains to Juandah Creek, with the remainder draining to Horse Creek which also flows north to the Dawson River. The total catchment area to the confluence of Juandah Creek and Horse Creek is 357,600 ha, being 9% of the total catchment area to this confluence is contained within the MLA areas.

Mean annual flows from the MLA areas is approximately 9,000 ML/a, and makes up about 1.4% of the mean annual inflow to Glebe Weir on the Dawson River and less than 0.2% of the total mean annual flow at the Fitzroy River mouth.

The MLA areas consist of undulating to near flat terrain, with gently-sloping ridges aligned north-south. Two main terrain elements are present:

- » alluvial floodplains, which vary in width from less than 500 m to about 2 km, and generally have a slope towards the creek channel and downstream of less than 2%. These landscapes occur at a surface elevation (RL) of approximately 230 m to 250 m Australian Height Datum (AHD). The floodplains have largely been cleared for beef cattle grazing and limited fodder cropping. Remnant riparian vegetation is present along the creek lines
- » low undulating hills, with an RL of between 250 m and 295 m AHD, make up the majority of the MLA areas. Slopes are generally less than 4%, but locally the upper slopes are up to about 15%. Land in the undulating

terrain is largely cleared for agricultural uses, with fodder crops on the flatter gradients, and beef cattle grazing on steeper slopes.

A number of impact assessment studies have been undertaken associated with surface waters and water supply and management, including:

- » fluvial geomorphology
- » water quality
- » conceptual water management system design
- » historical simulation water balance
- » flood impact
- » water supply:
  - › water demand
  - › conceptual water supply system design
  - › groundwater impact assessment for Great Artesian Basin.

#### Assessment of Water Quality

Existing water quality associated with surface watercourses on and adjacent to the MLA areas found the water quality environmental values to be relatively low, and indicative of a slightly to moderately disturbed system. The environmental values are dictated by the ephemeral nature of the waterways, and agricultural development within and surrounding the MLA areas.

Nutrient pollution is evident in the study area, with elevated total nitrogen and total phosphorus concentrations compared to guidelines. Given the nutrient pollutants identified and agricultural land use in the MLA areas, nutrient pollutants are likely to result from fertiliser application and other nutrient concentrating activities.

Further water quality monitoring will continue using the existing and proposed water quality monitoring network for the MLA areas in order to examine seasonal variations and variations in flow.

#### Water Management

A system of stream diversions and flood levees is proposed to prevent flooding of mine pits in events up to the one in a thousand year flood event (ie. 0.1% Annual Exceedence Probability (AEP) design flood event), and to ensure that during Project operations, flow in major streams will pass through the site and maintain downstream processes while preventing erosion and sediment transportation.

The impact assessment identified a minor risk that the diversions and levee structures have the potential to increase upstream and downstream flood levels and to impact on the sustainability of the local drainage system through increased flow velocities. The impact of the proposed diversion designs on flood levels was therefore investigated using flood models. The results of the modelling show that at the Woleebee Creek diversion, peak flood flows may increase slightly due to a loss of flood storage, and consequently, downstream



peak flood levels in Juandah Creek could increase by up to 300 mm during a one in a hundred year flood (1% AEP flood). At other locations, the modelling of the diversion design concept showed limited upstream increases in flood levels.

Refinements of the stream diversion plan will ensure that stream diversions meet all current acceptable design criteria, as defined in the Central West Regional Office of the Department of Natural Resources and Water guidelines, *Watercourse Diversions – Central Queensland Mining Industry*. If the refinements introduce an increase in flood levels not currently predicted by the flood modelling, then any potentially affected properties and infrastructure will be identified, and the property owners will be consulted during the water licence application process.

Runoff from disturbed areas within the MLA areas will be managed under the site water management system. In summary, the water management system will be designed so that:

- » there will be no planned off-site discharge of pit/process water into natural surface waters under normal operating conditions unless the flow meets the Environmental Authority conditions
- » overburden runoff will be directed into sediment dams
- » clean water will be diverted around the mine pits
- » a Mine Water Management Plan will be prepared to guide the site Water Management System (WMS)
- » monitoring of water quality within the site WMS will be conducted prior

to and during mining, and the design of the WMS modified if indicated as required by the monitoring results.

The mine and associated water management system are expected to result in a minor reduction of mean annual flows immediately downstream of the MLA areas, the maximum reduction being approximately 3% by Year 30 of the Project. The nearest surface water entitlement holder is approximately 20 km downstream along Juandah Creek at the confluence with Horse Creek. Here the total impact is estimated as a decrease of approximately 2% of mean annual flows by Year 30. As the mean annual flow of the Wandoan region represents less than 0.5% of the Dawson River at the confluence with Juandah Creek, the effect of the Project on water yield at this location and further downstream on Dawson River at Glebe Weir is negligible.

The WJV will continue to consult with landowners who take stock or domestic use water and entitlement holders regarding surface water flows.

If coal seam methane by-product water is adopted as the raw water supply source, the raw water storage dam may be lined if required to protect nearby groundwater and soils. Consideration will be given to clay-lining the dam if suitable materials can be obtained locally. Alternatively, a polyethylene liner may be used to provide an impermeable barrier to leakage. Sufficient monitoring bores will also be installed to detect any leakage before it contaminates downstream water resources.

#### **Potable and Raw Construction Water Supply**

The results of the groundwater impact analysis show that the impacts of drawing additional water for construction from the GAB Precipice Sandstone aquifer are relatively small and temporary on water users and environmental values. Existing Precipice Sandstone bores will be monitored. If impacts on nearby bores attributable to the Project are greater than anticipated, the WJV will make good any loss of water supply.

#### **10.5.2 CSM WATER SUPPLY PIPELINES**

The southern CSM water supply pipeline is located within the upper reaches of the Condamine River catchment and the upper reaches of the Dawson River catchment, and crosses a number of creeks including Juandah Creek and a number of smaller tributaries, including Sandy Flat Creek, and Dogwood Creek, and a number of its smaller tributaries, including Eleven Mile Creek, Nine Mile Creek, Wallan Creek and L Tree Creek. Other smaller unnamed drainage lines are also crossed by the proposed pipeline route.

The western CSM water supply pipeline is located in the upper reaches of the Dawson River catchment, and crosses a number of creeks including Eurombah Creek and Horse Creek, and a number of smaller tributaries of Eurombah Creek including Slatehill Creek, Barton Creek, Kangaroo Creek, and Canal Creek. Mud Creek

and Woleebee Creek, both of which form tributaries of Juandah Creek are also proposed to be crossed by the pipeline. Other smaller unnamed drainage lines will also be crossed.

Once constructed, hydrostatic testing of the pipeline will be undertaken. Water used for this testing will be captured and, subject to water quality, recycled for further tests or for use as construction water on the mine site. If leaks are detected, testing will cease immediately.

During operation, regular maintenance and monitoring of the selected pipeline will be conducted to minimise the potential for pipeline leaks or ruptures to occur. This will include continuous monitoring of flows and regular inspection of the pipeline condition.

Provided the mitigation measures are implemented, construction and operation of the selected water supply pipeline should not have residual impacts on surface waters.

### 10.5.3 GLEBE WEIR RAISING

Modelling undertaken to assess the hydrological impact of water supply from the Dawson River indicates that:

- » 6,500 ML could be provided from the Glebe weir raising, and 3,210 ML of medium A priority water would be purchased to make up the 2,000 ML high priority 8,500 ML required for supply to the mine
- » under the proposed management strategies, the mandatory water allocation security objectives (WASOs), which represent the rights of the existing water entitlement holders, and all mandatory environmental flow objectives (EFO) outlined in the Fitzroy Water Resource Plan (WRP) will be met
- » some non mandatory EFOs will not be met after supplying Project demand, however those EFOs are not currently met for the existing WRP development conditions. The deviations are quantitatively small and some statistics show similar small improvements.

The Glebe Option will impact some unsupplemented users below Nathan Gorge by reducing the available number of days they can harvest water each year by a maximum of up to one day. There is no specific performance objective for these allocations. However, if required, SunWater will discuss compensation arrangements with the affected water harvesters for the missed opportunity to pump.

When compared to the existing Fitzroy Water Resource Plan (WRP) conditions, the Glebe Option will reduce mean annual flows by up to 1.5% of the three Environmental Flow Objectives (EFO) reporting locations for the Dawson Valley Water Supply Scheme. The comparison of the results against the WRP target values shows all environmental flow statistics meet mandatory requirements.

It is recognised that the Glebe Option could supply 8,500 ML/a of raw water to the Project

which will cover the 8,400 ML/a for the initial years of Project operations. Peak demand for the mine is estimated to be around 9,100 ML/a in Year 15. If the Glebe Option is selected the additional raw water demand requirements in Year 15 will need to be sourced elsewhere at that time, either from on-site supplies (ie. from surface runoff collected in onsite dams) or another off-site water supply provider.



## 10.6 TRANSPORTATION

### 10.6.1 MLA AREAS AND PIPELINES

#### Traffic and pavement impacts associated with the MLA Areas and CSM Water Supply Pipelines

The main road traffic impacts will occur during the construction phase. The road transport impact assessment indicates that significant Project induced pavement impacts (that is, an increase in excess of 5% over existing levels) are likely to occur along the Leichhardt Highway during construction and operations phases. The construction impacts are highest during the peak construction period from the start of the second year of construction. The proposed initial mining activities during the two years of construction will incur pavement impacts as the ROM coal is transported north of the MLA areas.

Other roads in the district experience pavement impact increases below 5% over existing levels for each of the years investigated.

The construction and operation of the mine will result in increased commercial vehicle activity in the area around the Project as well as along the Warrego and Leichhardt Highways. Disruptions to traffic movements are likely during the construction phase of the Project due to trenching for the gas supply and water supply pipelines and due to the temporary road closures and relocations.

Roster changeover during construction is likely to create an increase of more than 5% in traffic along the Leichhardt Highway between the Warrego Highway and Capricorn Highway during the two years of construction. However, this impact will not be a daily occurrence, and should only be experienced around every 10 days. As the construction workforce traffic

will be non-commercial vehicles (i.e. private cars), there will be no pavement impacts.

### Safety impacts

In consultation with the Department of Main Roads, Dalby Regional Council, and other key bodies including school bus providers, the WJV will develop a Traffic Management Plan for the adjacent road network (State controlled roads and local roads) taking into account existing school bus routes in the area, to ensure the safety of the public (including school children) and construction workers and to minimise as far as practicable disruptions to traffic.

The WJV will undertake consultation and negotiations with the Department of Main Roads and Dalby Regional Council (and, if considered appropriate, other significant project proponents in the region) in relation to road closures, realignments and repair and maintenance of impacted roads. Any repair and maintenance agreement in relation to State or local roads will include provisions for Project-induced damage to road pavement from construction and operations, and reparation costs to appropriate standards.

During construction of pipelines where roads are intersected, appropriate traffic management techniques will be employed to ensure the safety of construction workers and the public, and to minimise disruption to traffic. Road pavements will be maintained and repaired to a suitable condition post construction works, in cooperation with the Department of Main Roads and Dalby Regional Council.

### Glebe Weir Raising and Pipeline Traffic Impacts

Glebe Weir and weir pumping station construction would generate an increase in traffic on the Leichhardt Highway north of Taroom of less than 5% over the January 2010 to November 2011 period, and therefore is considered to be minimal.

Impacts on road infrastructure and other road users associated with constructing the pipeline and the auxiliary pumping station would result from transport of construction materials and movement of the workforce. While this estimate suggests that commercial vehicle movements on the Leichhardt Highway near Wandoan may increase by more than 5% as a result of pipeline construction, impacts should not be significant because:

- » the increased traffic would be temporary, confined to the construction period
- » the actual increases in total and commercial vehicle movements may be less because some vehicles including buses and concrete trucks are likely to travel from Taroom without using the Leichhardt Highway.

## 10.7 AIR QUALITY

The air quality study included an assessment of potential impacts to air quality against goals specified in the Environmental Protection (Air) Policy 1997 and other

relevant guidelines, and the development of measures to mitigate against these impacts.

Cumulative traffic impacts from Project components and associated with other projects such as the Surat Basin Rail are described in 9.22.

### 10.7.1 MLA AREAS

Construction of mine infrastructure, including the potential gas fired power station, will include land clearing, civil works, structural installations and road constructions. The air quality impacts of these activities are expected to be low and short term, and will not occur near any sensitive receptors.

In assessing the potential impacts of the proposed mining activities, a number of scenarios were considered, which took into account a “snap shot” of the number and type of all proposed operating equipment over the life of the mine. Predictions have been made for Years 1, 5, 10, 20 and 30 for dust deposition, total suspended particles, and PM<sub>10</sub> (ie particles less than 10 micrometres in size) under worst case meteorological conditions.

An assessment of air quality impacts considered the combined air quality impacts of the Project related activities. This assessment determined that air quality exceedances may occur at some sensitive receptors throughout the life of the mine. Mitigation measures for mining activities include a comprehensive air quality management plan for both construction and operation phases to avoid, minimise and manage potential air quality impacts. This plan will include an air quality monitoring program with continuous real time total suspended particulates (TSP), PM<sub>10</sub> and meteorological conditions at representative sites. A trigger action response protocol will also be prepared and tied to the monitoring program to manage air quality impacts. A community hotline will be established for residents who wish to report air quality related incidents associated with the construction and operation of the Project.

Mitigation measures proposed by the WJV to minimise dust impacts from the mine include:

- » grading and watering haul roads and if necessary use of surface treatments and water sprays, covers and closed in chutes on conveyors
- » progressive rehabilitation of disturbed areas as mining operations progress
- » surface treatment will be applied to minimise coal dust emissions during transit
- » laboratory work has been completed to investigate the relationship between dustiness and moisture of the Wandoan coal to assist in the management of coal dust emissions
- » minimising disturbed land at any one time through staged development
- » haul road dust management including water sprays and dust suppressants
- » construction (or planting) of wind breaks.

### 10.7.2 WASTEWATER TREATMENT PLANT AND POTABLE WATER TREATMENT PLANT

During site preparation works (vegetation clearing, etc) and initial construction (i.e. upgrade of the existing wastewater treatment plant and potable water treatment plant), air quality impacts are expected to be low and only occur for a short duration due to the transient and relatively small nature of these activities.

### 10.7.3 GAS AND RAW WATER SUPPLY PIPELINES

Dust emissions during construction of any pipelines will be associated with land clearing, ground excavation and back filling. Due to the small surface area of disturbed land (approximately 10 m to 20 m in width), exceedences of EPP (Air) goals for dust emissions are not expected to occur at sensitive receptors.

A dust management plan will be developed for the construction of any pipeline and will include measures, where necessary, such as the use of water sprays during excavation when sensitive receptors are located within 500 m of the pipeline corridor, and revegetation of disturbed area as soon as possible following backfilling of the pipeline trench.

## 10.8 GREENHOUSE GASES & CLIMATE CHANGE

### 10.8.1 GREENHOUSE GAS EMISSIONS

An inventory of projected annual and total greenhouse gas (GHG) emissions was prepared by URS on behalf of the WJV, for the construction and operation phases of the mine and related infrastructure. A separate inventory of GHG emissions was prepared for the proposed Glebe Option (Volume 4). Preliminary analysis of the GHG impacts of the southern and western pipeline options were considered and found to be significantly less than the Glebe Option, and therefore were not separately assessed.

The inventory included material Scope 1 emissions (direct emissions – including fugitive emissions from coal seam gas and fuel usage) and Scope 2 emissions (indirect emissions from the consumption of electricity) found within the organisational boundary of the Project, as well as Scope 3 emissions (which is an optional reporting class of all other indirect emissions such as use of product coal).

Significantly, the EIS GHG assessment indicates that the coal seam methane gas content of coal from the MLA areas is around 1.4kg per tonne of run of mine (ROM) coal. The standard concentration used to calculate fugitive emissions in Queensland (IPCC Guidelines for National Greenhouse Inventories) is around 17.1kg per tonne of ROM coal. This means that the fugitive emissions from the Wandoan Coal Project are estimated to be around 12 times less than standard fugitive emissions.

The average combined annual Scope 1 and 2 GHG emissions for the Project will depend on the final power supply option selected.



When viewed in an Australian or Queensland context, the estimated Scope 1 and 2 peak annual emissions from the Project would be approximately 0.38% of Queensland's human-induced emissions and 0.11% of Australia's human-induced emissions (based on 2006 emissions data).

Annual average global human-induced GHG emissions are estimated as 28,600 Mt CO<sub>2</sub>-e. This estimate is an aggregate of emissions available from the United Nations Framework Convention on Climate Change and includes aggregate emissions estimated from reporting countries (generally, emissions from developing countries are not included in this estimate). The Project's maximum annual full fuel cycle emissions (i.e. total Scope 1, 2 and 3 emissions which includes end-use of coal for production of electricity) are estimated to be approximately 49.9 Mt CO<sub>2</sub>-e per annum. Based on current data and technology, this estimate represents 0.17% of annual global human-induced, reported emissions. However, global advances in GHG emission reduction technology could make a substantial difference to this percentage over time.

Approximately 99% of the Project's emissions are attributable to end-use of coal for electricity production which will be totally or predominantly overseas. To this end, the demand for coal for electricity production would exist regardless of the location of the source.

Given that the predicted Scope 1 emissions of the Project are above 25,000 tCO<sub>2</sub>-e, the Project will be required to report under the National Greenhouse and Energy Reporting Scheme and participate in the Australian Government's Carbon Pollution Reduction Scheme (CPRS), which is proposed to begin in late 2010.

In addition to participation in the CPRS, the WJV proposes a program of energy efficiency measures throughout its operations to minimise consumption of electricity and therefore GHG emissions. The WJV's key energy efficiency commitments are listed in section 8.2.4 above, which include investigation of potential renewable energy sources, such as on-site solar generation.

Xstrata Coal is actively involved in number of research, development and demonstration

programs for low emission technology and other initiatives, and has committed around \$250 million in financial support to low emissions technology projects, including:

- » involvement in Australia's Greenhouse Challenge Plus program;
- » Contributing significantly to the Australian coal industry's \$1 billion COAL 21 Fund, through a voluntary levy on coal production to fund the development and demonstration of low emission technologies in Australia
- » Corporate participant in the \$AUD 220 million Oxyfuel Project lead by CS Energy. The aim of the Oxyfuel Project is to test the feasibility of technology to capture carbon dioxide from CS Energy's Callide A power station in central Queensland and store it underground. The technology is of global importance, as it has significant potential to reduce greenhouse emissions in the power sector
- » working with the CO2CRC on the CO<sub>2</sub> storage demonstration project in Otway Basin, Victoria
- » as announced on 26 November 2008, Xstrata Coal has become a foundation member of the Global Carbon Capture and Storage Institute (GCCSI). The GCCSI, announced in September 2008 by Prime Minister Kevin Rudd, aims to accelerate the commercial deployment of carbon capture and storage technologies.

#### 10.8.2 CLIMATE CHANGE

According to the Climate Change in Australia (CSIRO, 2007) and Climate Change in Queensland (Office of Climate Change, 2008) Reports, with regard to the impacts of climate change on the mine's operation, it is suggested that the local conditions will become hotter, drier and windier with more intense rainfall events during the operating life of the mine.

A risk assessment has been undertaken to evaluate the risks to mine operations as a result of various potential climate change impacts on mining operations. This approach is consistent with the Australian Standard for Risk Management AS/NZS4360:2004. Risk Mitigation Measures will assist the mine to adapt to the potential impacts of climate change on its operation.

Key possible risks to mine operations may include reduced water availability, increased flood risk, increased soil erosion, increased slope failure and unsuccessful rehabilitation.

Design, procurement and management measures will be implemented to increase water recycling and beneficial reuse, manage dust emissions, manage the impact of floods, reduce the likelihood of soil erosion, increase the success rate of rehabilitation planting and improve the stability of overburden. These measures, which are detailed throughout the EIS, will assist the mine to adapt to the potential

impacts of climate change on its operation. These measures will ensure that climate change related impacts will not affect the environmental or commercial feasibility of the Project.



## 10.9 NOISE

A comprehensive noise impact assessment has been undertaken for the Project.

### 10.9.1 CONSTRUCTION

Leading industry practice processes and methods will be implemented and included in the Construction Management Plan to manage construction noise and minimise disturbance to sensitive receptors.

Construction activities for the MIA, CHPP and proposed onsite gas-fired power station (if built) will generally be centralised within the MLA areas, at least 5km away from the most exposed sensitive receptors. This separation distance will minimise any potential noise impacts at the receptors.

Noise impacts from the construction of the gas supply and raw water supply pipelines are expected to be minor and will generally be limited to a short construction period for any location along an alignment. There are not expected to be any significant noise related impacts arising from construction of the pipelines.

### 10.9.2 OPERATION

An assessment of noise impacts based on the combined noise impact of Project related activities, for mine operational Years 1, 5, 10, 20 and 30 was conducted under worst case meteorological conditions. Overall, the noise assessment demonstrates that noise impacts from the Project will be within the required noise levels at most sensitive receptors over the life of the mine. However, the Project's mining activities will potentially adversely affect existing noise levels at some sensitive receptors.

The WJV proposes to mitigate and manage noise impacts on sensitive receptors by implementing a combination of management actions to meet noise quality goals, including:

- » a Noise Management Plan with triggers for management actions based on Environmental Authority conditions
- » the use of lower noise and noise attenuated machinery in specific mining pits during respective operational scenarios
- » noise monitoring program
- » meteorological forecasting system
- » restriction of activities during adverse weather conditions where monitoring indicates that conditions of the Environmental Authority will not be met
- » a community hotline for reporting of any noise related incidents and complaints management process.

For the gas supply and raw water supply pipeline operations, activities are expected to meet the required environmental goals once all of the mitigation measures are implemented, and therefore no residual impacts are expected to occur.

## 10.10 VIBRATION

The main source of vibration on the MLA areas will be from blasting during the operations phase. Other potential sources of vibration include coal trains and coal handling and preparation plant operations and infrequent vehicular heavy lifts along the Leichhardt Highway.

A vibration assessment was undertaken to examine the sources of vibration, potential impacts, and mitigation and management measures. This assessment was undertaken in accordance with the provisions of the EPA's Guideline Noise and Vibration from Blasting (2006). The EPA Guideline lists recommended human comfort criteria relating to: ground vibration peak particle velocity; airblast overpressure level; and times of blasting.

### 10.10.1 CONSTRUCTION

No blasting is likely to be required for the construction phase for any of the Project's activities. Construction activities with the potential to cause vibration are limited to infrastructure such as the rail spur and transport of heavy equipment. Ground vibration impacts are expected to be low as a result of these activities.

Traffic levels along the Leichhardt Highway will increase during the construction phase including some traffic related to heavy lifts. However, potential vibration impacts during construction are considered to be low.

### 10.10.2 OPERATION

Vibration modelling was undertaken to predict the ground vibration and airblast overpressure levels potentially generated by blasting at the various mine pits. Unmitigated impacts from blasting are predicted to exceed the recommended EPA Guideline limits at a number of sensitive receptors.

The following mitigation measures will be implemented by the WJV to manage potential vibration impacts for the MLA areas to within the vibration goal limits:

- » notification of blasting operations in advance of blasting events
- » limiting the method of mining operations (equipment type, drilling and blasting) in Frank Creek Pit to meet Environmental Authority conditions
- » with the co-operation of landowners, undertake condition surveys of buildings and structures within 2 km of blasting activities prior to commencing blasting operations, with the commitment to "make good" any impacts to buildings and structures from blasting, based on the survey information
- » development and maintenance of a Blast Management Plan that will include procedures to avoid blasting in unfavourable weather conditions and response to unfavourable blast outcomes. An integral part of the Blast Management Plan will include vibration monitoring, data analysis, reporting and modelling
- » trigger action response protocol where airblast overpressure levels exceed vibration goal limits.

Blasting is not likely to damage power lines, pipelines, groundwater bores, roads or railways outside the MLA areas. Vibration from the operation of the draglines, CHPP and conveyor are not likely to impact on sensitive receptors.

No mitigation measures are required for the operation of the gas supply pipelines or associated with raw water supply options.

## 10.11 TERRESTRIAL ECOLOGY

The four key components of the Wandoan Coal Project are controlled actions under the EPBC Act, for which the relevant controlling provisions for all four were Sections 18 and 18A (listed threatened species and ecological communities). For the Glebe Weir raising and pipeline only, additional relevant controlling provisions were sections 20 and 20A, relating to listed migratory species.

The sections below summarise the existing environment, key impacts and mitigation measures. However, the common residual impact mitigation strategy for terrestrial ecology for the Project is the development of a Biodiversity Offsets Strategy. This will be developed in consultation with the Environment Protection Agency and the Commonwealth Department of the Environment, Water, Heritage and the Arts. The Biodiversity Offsets Strategy will include offsets for the Project, including the preferred raw water supply pipeline option, and include vegetation offsets with a ratio of 3:1 of "like for like".

In reference to Matters of National Environmental Significance (MNES), the subject of the EPBC Act referral for the MLA areas, related



infrastructure and pipelines, the impact assessment concluded that the Project was not likely to result in a significant impact to any threatened species of plant or animal, Regional Ecosystem or ecological community.

#### 10.11.1 THE MLA AREAS AND GAS SUPPLY PIPELINE

The MLA areas are largely cleared of remnant vegetation as a result of grazing and dryland agriculture. The remaining remnant vegetation is generally restricted to the main drainage lines traversing the area. Vegetation along these drainage lines is dominated by RE 11.3.25 (*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines) with RE 11.3.2 (*Eucalyptus populnea* woodland on alluvial plains) spreading across the floodplains. This vegetation is recognised as having regional significance under the Biodiversity Planning Assessment for the Brigalow Belt bioregion. Other remnant vegetation in the MLA areas was highly fragmented. *Eucalyptus populnea* (Poplar box) (RE 11.9.5 has a conservation status of Endangered under the *Vegetation Management Act 1999* (VM Act) and is also consistent with the Brigalow (*Acacia harpophylla* dominant co-dominant) Endangered ecological community under the EPBC Act.

For regional ecosystems, in summary:

- » Of approximately 32,000 ha of MLA areas, a total of 673 ha remnant and 502 ha of non-remnant regional its ecosystems are predicted to be cleared. 63% of remnant vegetation and 51% of non-remnant vegetation will be retained.
- » in relation to the Commonwealth listed Endangered regional ecosystems (RE) of Brigalow (RE 11.9.5 & 11.9.6, dominant co-dominant, 35.4 ha remnant and 230.4 ha non-remnant) and Semi Evergreen Vine Thicket (RE 11.9.4, 16.7 ha non-remnant) will be cleared
- » the State listed endangered regional ecosystem 11.9.10 (Brigalow and Poplar box open forest) is predicted to have 71.77 ha of remnant and 213.5 ha of non-remnant vegetation cleared

Surveys found one Threatened species of plant, Belsons Panic (a grass, *Homopholis belsonii*) and four Rare or Threatened fauna species animal, Brigalow Scaly-foot, Golden-tailed Gecko (*Strophurus taenicauda*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*) and Little-Pied Bat (*Chalinolobus picatus*). In addition, 15 other rare or Threatened species of animal were considered likely to occur in the study area and surrounds.

Potential mining related impacts will include loss of vegetation and habitats, fragmentation and loss of connectivity.

Prior to the start of construction, comprehensive mitigation measures will be developed and presented in a biodiversity and land management plan relating to the construction and operation of the mine. The plan will include:

- » areas to be rehabilitated, with areas progressively revegetated in keeping with company policy and the pre-mine vegetation types
- » staff/contractor inductions and continuing education of staff
- » pre-clearing surveys and fauna salvage/translocation and other potential mitigation measures (such as fauna underpasses and overpasses and fencing)
- » rehabilitation and restitution of adjoining habitat
- » weed control and pest management
- » an adaptive flora and fauna monitoring program for the Project.

Seasonal surveys have been completed for the MLA areas, however, further seasonal surveys are to be undertaken in relation to the gas supply pipeline, with surveys proposed for the summer period of 2008/09. If those seasonal surveys detect threatened species, then the findings of the MNES significance assessment will be reviewed.

#### 10.11.2 SOUTHERN CSM WATER SUPPLY PIPELINE

The proposed pipeline corridor traverses a range of land uses and areas of different biodiversity value, including grazing and dryland agriculture, and fourteen Regional Ecosystems, including two listed as Of Concern and one listed as Endangered under the VM Act. One of these Regional Ecosystems is also consistent with the Brigalow (*Acacia harpophylla* dominant and co-dominant) Endangered Ecological Community listed under the EPBC Act.

Vegetation associated with the Great Dividing Range forms part of a State Wildlife Corridor and also includes areas of Essential Habitat mapped under the Biodiversity Planning Assessment framework. Vegetation associated with the Great Dividing Range is also referred to as the Gurulmundi Special Area under the Biodiversity Planning Assessment.

Field surveys in the study area identified three species of Rare or Threatened fauna, being:

- » Brigalow scaly-foot (*Paradelma orientalis*)
- » Little Pied Bat (*Chalinolobus picatus*)
- » Golden-tailed Gecko (*Diplodactylus taenicauda* syn, *Strophurus taenicauda*)

No Threatened species of plant were recorded during winter surveys. Further seasonal field surveys will be undertaken to determine the location size and extent of Threatened species likely to be affected by the proposed pipeline, with surveys proposed for the summer period of 2008/09. If those seasonal surveys detect threatened species, then the findings of the MNES significance assessment will be reviewed.

The proposed pipeline is likely to require clearing of 55.8 ha of remnant vegetation and 30.0 ha of non-remnant vegetation. This vegetation is primarily located along the road reserve or easement edge of large patches of vegetation and as such is generally subject to a range of edge effects. Potential impacts include loss of vegetation and habitats (land clearance), habitat fragmentation and barrier effects, edge effects, mortality, weeds and pest species, noise and dust, cumulative impacts during the construction and operation of the pipeline.

Impacts will be minimised during detailed design by the placement of the pipeline. A biodiversity management plan will be developed for the construction and operation of the pipeline and will include measures to minimise and manage potential impacts to flora and fauna.

#### 10.11.3 WESTERN CSM WATER SUPPLY PIPELINE

Despite being a largely cleared landscape, the minor remaining remnant vegetation along the drainage lines is of regional significance. In addition, much of the non-remnant vegetation in the road corridors was identified to include Brigalow (*Acacia harpophylla* dominant and co-dominant) and semi-evergreen vine thickets. These are Endangered ecological communities listed under the EPBC Act, which provide habitat for Rare and Threatened species including, recorded in the study area:

- » Brigalow Scaly-foot (*Paradelma orientalis*)
- » Little Pied Bat (*Chalinolobus picatus*)
- » Eastern Long-eared bat (*Nyctophilus timoriensis*)
- » Golden-tailed Gecko (*Diplodactylus taenicauda*).

In addition to these species, a further two Threatened species of plant and 13 Rare or Threatened species of animal were considered likely to occur in the study area and surrounds.

Further seasonal surveys are to be undertaken in relation to the pipeline corridor, with surveys proposed for the summer period of 2008/09. If those seasonal surveys detect threatened species, then the findings of the MNES significance assessment will be reviewed.

Overall however, the proposed pipeline is likely to require clearing of only 0.76 ha of remnant vegetation and 7.0 ha of non-remnant vegetation and associated habitat.

Accordingly, the potential impacts of loss of vegetation and habitats through land clearance, habitat fragmentation and barrier effects, edge effects, mortality, weeds and pest species, noise and dust, and cumulative impacts and operation of pipeline on terrestrial ecology, will be minor.

Impacts will be minimised during detailed design by the placement of the pipeline. A biodiversity management plan will be developed for the construction and operation of the pipeline and will include measures to minimise and manage potential impacts to flora and fauna.

#### 10.11.4 GLEBE WEIR RAISING

No rare or threatened species were confirmed within the Glebe Weir raising inundation area or the pipeline footprint although a number, including *Arthraxon hispidus*, *Livistona nitida*, *Rutidosia crispata* and *Thelypteris confluenta* were confirmed nearby. *Eriocaulon carsonii* (Salt Pipewort, Button Grass, also endangered) was found at the nearby boggomoss.

Velvety Tree Pear (*Opuntia tomentosa*) was the only declared pest plant species recorded within the inundation during ground survey while *Opuntia* spp. (prickly pear) were found along the pipeline route, in low numbers but present in most areas.

Regional Ecosystems (REs) that would be subject to clearing or inundation as a result of the Glebe Weir Raising option are mainly riparian areas of the river and tributaries. Two of these REs (RE 11.3.1 and RE 11.9.5) are analogous to the Commonwealth-listed 'Brigalow (*Acacia harpophylla* dominant and co-dominant) community', which has an Endangered management status under the provisions of the EPBC Act.

Based on database searches, two terrestrial invertebrate species of conservation significance may occur within the local area: *Jalmenus evagoras eubulus* (Imperial Hairstreak Butterfly) (northern subspecies) and *Adclarkia dawsonensis* (Boggomoss Snail). Ground surveys did not find the Imperial Hairstreak Butterfly and as the nearest record to the study area is over 100 km distant, it is unlikely that the species is present.

Two populations of the Boggomoss Snail are currently known from the region and have been confirmed by recent survey. One population is confined to a 44.5 ha patch of riparian habitat approximately 30 km downstream of Glebe Weir, while the smaller population is in a 0.5 ha patch of boggomoss habitat within a designated reserve some 1 km north of the weir.

No impact on the snail is predicted in the construction phase. While a risk related to potential waterlogging near the Boggomoss Creek levee has been identified in the

operational phase, adoption of the proposed mitigation strategies will reduce the risk to nil.

Terrestrial vertebrates species detected by ground survey which are listed under State or Commonwealth legislation as Endangered, Vulnerable or Rare were:

- » Rough Frog, *Cyclorana verrucosa*
- » Grey Falcon, *Falco hypoleucos* (flow over)
- » Squatter pigeon, *Geophaps scripta scripta*
- » Little pied bat, *Chalinoobus picatus*

A number of other species, particularly migratory bird species are considered as highly likely to occur in the area at different times of year including Brigalow Scaly-foot, Large-eared Pied Bat and Grey Snake.

A number of vegetation communities known on the margins of the Dawson River and its tributaries are analogous to the 'community of Native vegetation species dependent on natural discharge of groundwater from the Great Artesian Basin' listed as Endangered under the provision of the EPBC Act. Locally these communities are known as 'boggomoss' communities. One boggomoss, not previously mapped until studies undertaken for the Glebe Weir Raising option, will be inundated in the Cockatoo Creek area.

The endangered aquatic macrophyte *Myriophyllum artesium* was found associated with a boggomoss on Sandy Creek upstream from the proposed sand extraction area.

Mitigation measures proposed by SunWater to reduce identified terrestrial fauna impacts to levels that will not cause permanent harm to fauna populations include:

- » ensure existing hydrological regimes directly and indirectly influencing the existing Mt Rose Station Boggomoss Snail population are maintained
- » implementation of a Construction Management Plan
- » for affected ecosystems and species, offset through habitat restoration and enhancement of comparable ecosystems in the local area
- » habitat rehabilitation and restoration to maintain local wildlife corridor function
- » develop and implement an Animal Pest Species Management Plan
- » revegetate weir edges and exclude livestock
- » retention, where possible, of large, dead trees in inundation area for migratory bird habitat.

In reference to Matters of National Environmental Significance (MNES) the subject of the EPBC Act referral for the Glebe Weir raising and pipeline, the impact assessment concluded that the raising and pipeline was unlikely to result in a significant impact to any

threatened species of plant or animal, RE or ecological community or migratory species.

## 10.12 AQUATIC ECOLOGY

### 10.12.1 MLA AREAS AND GAS SUPPLY PIPELINE

Sites in the MLA areas and along the gas supply pipeline typically have extensive bank erosion, low habitat variability, and substrates dominated by finer sediments such as sand and silt. The environmental values of the aquatic ecosystems are relatively low and consistent with those of the region generally. Environmental values are influenced primarily by the ephemeral nature of the region's waterways; although agricultural development (particularly grazing) within the region has significantly influenced water quality and the physical characteristics of aquatic habitat.

Construction and mining activities have the potential to impact on aquatic ecology. The potential impacts of fuel handling, vegetation clearing, dam operation and water discharge on the creeks within the MLA areas (and downstream waterways) will be minimised through following current industry environmental management guidelines.

Of the potential impacts on the creeks in the MLA areas, the diversion of creek channels, and the construction of creek crossings, which can affect fish movement, have the potential to result in the greatest localised impact to the aquatic environment.

The mine is highly unlikely to have an impact on any threatened aquatic species or ecological communities, as these species and communities are unlikely to occur in the waterways of the MLA areas or along the gas supply pipeline.

Ongoing water quality and aquatic ecology monitoring are proposed in order to inform and update adaptive management of the Project.

### 10.12.2 SOUTHERN AND WESTERN CSM WATER SUPPLY PIPELINES

For the Southern CSM Water Supply Pipeline, observed sites along the proposed pipeline alignment typically have extensive bank erosion, low habitat variability (with no runs or riffles observed), and substrates dominated by finer sediments such as sand and silt. The environmental values of the aquatic ecosystems are relatively low and consistent with those of the region generally. Environmental values are influenced primarily by the ephemeral nature of the region's waterways and clearing of riparian vegetation along proposed pipeline alignments; although agricultural development (particularly grazing) within the region has significantly influenced water quality and the physical characteristics of aquatic habitat.

For the Western CSM Water Supply Pipeline, observed sites along the proposed pipeline alignment typically have low habitat variability (no riffles observed), moderate to extensive bank erosion and substrates dominated by finer sediments (e.g. sand and silt). However, Eurombah

Creek was in good condition, as it has good riparian vegetation cover, and it contained a variety of habitat types (deep pools and shallow pools), physical habitat for fauna (such as woody debris and overhanging banks) and substrate types (including sand, bedrock, and boulders).

No Rare or Threatened species of aquatic fauna have been recorded from the waterways of the study area for either the southern or western CSM pipeline options.

Mitigation measures have been proposed to manage the risk of potential impacts on the aquatic environment from spillage of fuels and other contaminants, vegetation clearing and earth moving, construction of creek crossings, spillage of CSM water, and the creation of mosquito breeding habitat. Provided the mitigation measures are implemented, construction and operation of the proposed pipeline will not significantly impact aquatic flora, fauna or habitats.

### 10.12.3 GLEBE WEIR RAISING

Construction impacts primarily relate to physical disturbance in the weir area, as pipeline creek crossing sites will very likely be dry during construction thereby avoiding downstream impacts. These are likely to be short term and local scale impacts.

The larger weir pool will provide similar habitat to existing conditions but with colder water of low dissolved oxygen content over a slightly larger area. The shallow expanse of water created off Cockatoo Creek is likely to favour a number of flora and fauna species, including floodplain breeding fish.

As the pipeline is trenched under creeks, no impact is expected during the operational phase.

The potential to transfer exotic fish through the pipeline was assessed as low but if it did occur, they would be unlikely to survive use in the coal washing process at the mine. The mine is in the same catchment and only a short distance upstream from the existing weir so the likelihood of the species not already being in those subcatchments is low.

## 10.13 WASTE MANAGEMENT

Following consultation with Dalby Regional Council, it has been determined that the existing Wandoan landfill facility is not a suitable long term waste disposal option for this Project due to its small capacity, which is already nearing capacity from waste generated in the local region. Assistance with the development of a new multi-user, municipal waste and recycling facility at a suitable location, adjacent to the mine site for disposal of general and domestic waste is being discussed Dalby Regional Council, in order to provide a long term solution to waste disposal in the Wandoan area.

In accordance with the Environmental Protection (Waste Management) Policy 2000 (EPP (Waste)) and the Environmental Protection (Waste Management) Regulation 2000 (Waste



Regulation), a strategic framework for managing wastes has been established, considering the waste management hierarchy of:

- » waste avoidance
- » waste re-use
- » waste recycling
- » energy recovery from waste
- » waste disposal.

All waste streams will be disposed to licensed landfills, reprocessors or recyclers, depending upon the given waste stream. Exceptions to this will be the disposal of green waste on-site for use in land rehabilitation and revegetation, and waste tyres that will be buried in a defined area on-site with the location entered onto the Environmental Management Register (EMR) managed by the Environmental Protection Agency (EPA).

## 10.14 VISUAL AMENITY

### 10.14.1 MLA AREAS

The visual amenity assessment determined that while infrastructure elements are of a large scale they will not project significantly outside of the MLA areas.

However, the creation of the various mine pits creates visual change and high visual effects on some immediate surrounding areas. These mining activities will be visible from local sensitive view locations such as the Leichhardt Highway and rural homesteads that are located around the MLA areas. Much of the Project site is generally not visible from the Wandoan Township due to a natural ridgeline between the town and the proposed mining areas.

Initially high visual impacts will result from the combination of high visual effects of the mine pit areas and the high sensitivities of homesteads and the highway. These impact levels will be sustained until landscape rehabilitation is carried out on completion of mining. Various viewpoints were examined surrounding the MLA areas and gas supply pipeline. Figure 10 provides a view of the existing area from the Leichhardt Highway north of Wandoan, looking south-west toward the proposed mining pits. Figure 11 provides a photomontage of the area from the same location after five years of mine operations.



Visual and landscape mitigation strategies developed for the MLA areas and gas supply pipeline aim to reduce impacts both in the short and long term. Short term strategies near to the sensitive points of viewing will achieve impact reduction while also achieving landscape upgrades in treated areas. Longer term strategies include landscape management of non-mine areas and treatment of mine areas, including progressive rehabilitation, to restore local visual amenity values to close to pre-mining conditions.

#### 10.14.2 PIPELINES

The construction phase will involve vegetation clearing and earthworks activities that have the potential to impact on the visual amenity of the area. Mitigation measures associated with landscape character and visual amenity during construction include, but are not limited to minimising corridor clearing to keep existing vegetation where practicable, ‘feathering’ the edge of cleared vegetation, and prompt rehabilitation of areas with pasture grasses or native species conducive to the surrounding vegetation. With these measures in place there is expected to be no significant residual visual impact created by pipeline construction or operation. This is due to the underground location of pipelines and the ability to restore surface areas to blend in with the adjoining landscapes.

### 10.15 INDIGENOUS CULTURAL HERITAGE

#### 10.15.1 MLA AREAS

Searches of the Cultural Heritage Database and Register for Aboriginal and Torres Strait Islander Cultural Heritage indicated that there are some sites of cultural heritage significance on the register which were likely to be affected by the MLA (these sites are all located within MLA 50230) and the gas supply pipeline.

Three archaeological studies are known to have occurred within the MLA areas. The latest survey conducted in 2007 suggested that in the kind of landscape surveyed, archaeological sites are likely to be small and of low scientific significance. The Iman People #2 will be consulted in relation to any future work on the area. Recommendations

from these studies included to continue consultation with the Traditional Owners.

In accordance with the *Aboriginal Cultural Heritage Act 2003* (ACHA), the Wandoan Joint Venture (WJV) has developed a Cultural Heritage Management Plan (CHMP) in consultation with the Iman People #2 who are the only registered native title claimants over the MLA Areas (NNTT No. QC97/55; Federal Court No. QUD 6162/98).

Agreement has been reached with the Iman People #2 in relation to the terms of the CHMP. The CHMP is in the process of being executed, and once it is fully executed it will be lodged with the Chief Executive for approval in accordance with the ACHA.

At all times, the WJV will comply with its duty of care obligations and any other obligations under the *Aboriginal Cultural Heritage Act 2003*, in relation to operations associated with the Project.

For the Gas Supply Pipeline, if built, once the CHMP for the MLA areas has been executed and approved by the Chief Executive in accordance with the ACHA, the WJV will seek to engage with the Iman People #2 in relation to the CHMP for the gas supply pipeline area.

#### 10.15.2 SOUTHERN CSM WATER SUPPLY PIPELINE

Based on the Department of Natural Resources and Water searches of the Cultural Heritage Database and Register for Aboriginal and Torres Strait Islander Cultural Heritage, it is possible that some identified cultural heritage sites may be impacted by the proposed pipeline.

If the proposed pipeline is chosen as the WJV’s preferred option for the supply of raw water and the WJV is the entity that will own and construct the pipeline, then the WJV will develop a CHMP for the proposed pipeline area, inviting the Iman People #2 and the Barunggam People to be involved in the process. The CHMP will provide for comprehensive surveys over the proposed pipeline area and the involvement of the Iman People #2 and the Barunggam People in the process.

#### 10.15.3 WESTERN CSM WATER SUPPLY PIPELINE

Based on the Department of Natural Resources and Water searches of the Cultural Heritage Database and Register for Aboriginal & Torres Strait Islander Cultural Heritage, recorded cultural heritage sites will not be impacted by the proposed pipeline.

If the proposed pipeline is chosen as the WJV’s preferred option for the supply of raw water and the WJV is the entity that will own and construct the pipeline, then the WJV will develop a CHMP for the proposed pipeline area, inviting the Iman People #2 to be involved in the process. The CHMP will provide for comprehensive surveys over the proposed pipeline area and the involvement of the Iman People #2 in the process.

#### 10.15.4 GLEBE WEIR RAISING

SunWater is working with the Wulli Wulli People and Iman People #2 to assess and



**Figure 10:** Viewpoint from the Leichhardt Highway, with existing view



**Figure 11:** Viewpoint from the Leichhardt Highway, after five years of mining

manage indigenous cultural heritage over the Glebe Option area, including measures to:

- » engage with the relevant parties to establish mechanisms for investigating Aboriginal cultural heritage
- » implement detailed surveys over the Glebe Option area to identify significant aboriginal objects and significant aboriginal areas
- » prepare and negotiate CHMPs with the relevant parties for the management of identified Aboriginal cultural heritage across the Glebe option area.

Ground survey results indicate that those cultural heritage sites that exist within the Glebe Option area (predominantly background scatters, isolated stone artefacts, scarred trees, stone artefact scatters and shell scatters) will potentially be impacted upon by the Glebe option.

The Engagement Agreements entered into with the Wulli Wulli People and Iman #2 outline a process for including the parties in the identification, management and protection of Aboriginal cultural heritage in the Glebe Option area, contain a process for undertaking a comprehensive and systematic cultural heritage assessment and outline a process for development of management strategies.

## 10.16 NON-INDIGENOUS CULTURAL HERITAGE

### 10.16.1 MLA AREAS AND GAS PIPELINE

None of the items identified within the Project area are listed or warrant listing under current cultural heritage legislation, as items in their own right. However they combine to give a clear understanding of the historical pattern of development in the area.

A range of mitigation measures will minimise impacts on the identified items. The following is a summary of the mitigation actions which will be implemented by the WJV:

- » consult with the community and the Juandah Historical Society with regard to the management of historical items identified
- » undertake, if feasible, structural and heritage architectural assessments and recording of the Booral homestead and meat shed, and possibly undertake removal of the meat house to the Juandah historical precinct or other recognised location
- » retain the survey markers where possible
- » retain the Settlers Bridge
- » consider funding initiatives that recognise and celebrate the non-indigenous cultural heritage of the area from the WJV community fund.

### 10.16.2 RAW WATER SUPPLY PIPELINES

No sites of National or State heritage significance are located along any of the proposed raw water supply pipeline alignments. Items with local significance were identified and

are representative of the development of transportation and communication in the district. For the Glebe Option, one important site, the Glebe Homestead, lies within close proximity to the inundation area near Cockatoo Creek. However, it will not be impacted and the present residents intend to remain on the property and to use the homestead.

A cultural heritage management plan will be developed to record and manage any non-indigenous cultural heritage items that may be identified during the planning of the development and during construction.

## 10.17 SOCIAL

### 10.17.1 MLA AREAS

The results of the Social Impact Assessment and community consultation program identified that the local community has a strong connection with the region's agricultural history and the land itself. Community members expressed the view that they are very community-focussed, have strong social connections, have a healthy enjoyment of the rural lifestyle they share, are family-focussed and many expressed their belief that the region is an excellent place to raise children.

The population in the region has been declining since 1996, and between 2001 and 2006, the area experienced a 24.7% decline in the population. These figures are in contrast to the overall Queensland population, which experienced growth of 8.2% over the same period. The loss of population could be attributed to impacts on rural lifestyle and enterprise (such as the drought, increased farm running costs and steadily increasing fuel prices), which may have affected the availability of employment and enterprise opportunities.

The current accommodation vacancy rate in Wandoan is 30%, Taroom 27%, Murilla 18%, Chinchilla 16% and Banana 13%, compared to Queensland at 9%. These vacancy rates suggest that the Wandoan area has capacity to provide (at least initially) for increased housing demand as a result of the Project.

The main impacts on existing social values from the Project will flow from the increase in population from the construction and operational workforces. In addition, the likely consequence of economic growth in the region will be increased property prices and rents for local and regional businesses, reflecting growth in demand for property as a result of increased population, income and business activity. This however should be offset by higher local employment and incomes.

Given the number of construction workers expected to be required during peak mine construction, it was not considered feasible to accommodate the bulk of that workforce within Wandoan township or adjacent towns. Accommodation facilities adjacent to the MLA areas are therefore proposed to be developed, both to benefit the Project,



through accessibility and minimisation of travel time for the workforce and minimise impacts on the surrounding accommodation.

The WJV anticipates that there will still be some demand for off-site accommodation during construction and operations, with workers most likely to locate at Wandoan, with some also in Miles or Taroom. Town based accommodation is expected to cater for between 125 and 150 employees plus their families by Year 4, with an assumed split of 60:20:20 residing in Wandoan, Taroom and Miles. To minimise impacts on accommodation, the WJV proposes to provide 15 houses and 10 two bedroom duplexes (or equivalent) for staff in Wandoan.

In consultation with the local community, strategies have been developed to enhance the potential benefits and manage any potential impacts of the Project on the social character and infrastructure of both the study area and the region. The WJV has a number of existing policies in relation to social and community engagement, sustainability, employment, environment, climate change, hazard and risk, and health and safety. These mitigation and enhancement strategies are specific to the Project.

Mitigation of potential social impacts and the maximisation of benefits to the community are crucial to the Project. All measures implemented will also depend on the support, participation and commitment of the local communities, service providers and government agencies to ensure ongoing success. The WJV is committed to effectively facilitate and inform their involvement to ensure success.

To assist in developing a positive outlook for the Project within the area and to assist ongoing assessments and consultation, the following mitigation measures and management strategies are proposed:

- » ongoing communication in the Project area and region to be based on Project outcomes and the planning needs of the community, stakeholders and service providers
- » ongoing communication with property owners impacted by the gas pipeline and consideration of impacts on existing

crops during the construction phase along with the timing of construction activities prior to planting of crops and after the harvest season

- » a Community Liaison Manager has been appointed and a future local person appointed to address concerns and enable proactive actions
- » the provision of a Social Involvement Plan (SIP) of community needs and responses to the Project with an internal annual review and five-yearly external technical review. This would be based on surveys, consultation with the local communities and local service providers
- » working with government and non-government services providers as a means to ensure an appropriate level of community services continue to be available within the Project area and region
- » develop, in co-operation with relevant government agencies, a local employment and training policy, particularly in relation to provision of apprenticeships/traineeships for local youth and school-based training through partnerships with local schools and training institutions.
- » a skills audit will be undertaken by the WJV within the local communities to provide an understanding of the range of skills and experience available locally and to determine where training opportunities could be directed. This may be carried out in conjunction with relevant government departments, such as the Department of Education, Training and the Arts
- » implement a tendering process for Project construction and operation supplies and services to encourage participation by local business
- » develop a Business and Employment Register to enable local and regional firms and interested persons to be included on a Project information database
- » encourage the development of business and service provider support networks

In terms of individual landholders within the MLA areas, the WJV commenced the process of consultation in 2007 following identification of landholders within the MLA areas. Negotiations to date have concluded the purchase of about one third of the properties identified, with consultation and negotiations ongoing with the remaining landholders. The WJV is committed to fair and open negotiations for land acquisition, with key acquisition strategy principles including:

- » all reasonable attempts will be made by the WJV to reach an amicable agreement with potentially affected landowners
- » the WJV will participate in any mediation process considered necessary



- » the WJV will continue to engage the community and potentially impacted landholders in consultation to provide information on the Project and enable the community to provide feedback and raise any issues of concern.

#### 10.17.2 CSM WATER SUPPLY PIPELINES

There is unlikely to be a significant change to the area's demographics as a result of either of the proposed pipelines, though there may be a temporary increase in young-adult males moving to the area during the 9 month construction period, these workers are not expected to remain in the region permanently.

Ongoing communication with individual property owners and the wider community will be an important part of managing expectations during further studies, approvals, and construction, and potential road and accommodation impacts (eg. temporary noise, dust, choice of accommodation).

#### 10.17.3 GLEBE WEIR RAISING

The raising of Glebe Weir may be expected to generate a number of relatively minor and short term localised impacts associated with the construction phase, including temporary closure of an adjacent camping area for safety reasons and potential traffic safety impacts. To mitigate the temporary closure of the camping area, notices directing users to alternative recreational areas will be provided.

Properties impacted by inundation will not become unviable and the current owners and lessees have indicated they intend to stay.

Impact assessment indicates there will be no significant impacts on existing, downstream water users.

In terms of temporary construction workforce accommodation, discussions with Banana Shire and Dalby Regional Council have indicated that temporary construction camp facilities may be used.

On balance, raising of Glebe Weir and the associated pipeline development has been assessed to have relatively few and low level local adverse social impacts. In aggregate terms, the Glebe Weir Raising option is expected to generate more social benefits than costs.

### 10.18 ECONOMIC

The Project will employ approximately 1375 people during the construction phase and up to 844 people during the operations phase. Applying Input-Output (I-O) analysis, the economic impact assessment indicated that the total flow-on benefits (direct, indirect, induced) resulting from the initial capital expenditure by the WJV (including raw water supply) are expected to provide the following flow-on impacts at the regional, State and national levels:

- » Regional: on average, the total flow-on affect is expected to contribute between \$10 million and \$14 million per annum in revenues associated with goods and services produced. This is expected to support between **159 and 212 jobs** per annum
- » State: on average, the total flow-on affect is expected to contribute between \$193 million and \$241 million per annum in revenues associated with goods and services produced. This is expected to support approximately **884 and 1,178 jobs** per annum
- » National: on average, the total flow-on affect is expected to contribute between \$63 million and \$79 million per annum in revenues associated with goods and services



produced. This is expected to support between **290 and 385 jobs** per annum.

During operations, the total flow-on economic benefits (direct, indirect, and induced) are estimated to be:

- » Regional: on average, the total flow-on affect is expected to contribute between \$13 million and \$16 million per annum in revenues associated with goods and services produced. This is expected to support between **151 and 202 jobs** per annum
- » State: on average, the total flow-on affect is expected to contribute between \$269 million and \$336 million per annum in revenues associated with goods and services produced. This is expected to support approximately **1,266 and 1,704 jobs** per annum
- » National: on average, the total flow-on affect is expected to contribute between \$31 million and \$39 million per annum in revenues associated with goods and services produced. This is expected to support between **142 and 192 jobs** per annum

The average production of 22 million tonnes of coal per annum over the life of the Project is expected to contribute significantly to royalty payments in Queensland. In total, it is expected that \$3.7 billion in royalty payments would be payable to the Queensland Government over the life of the Project. This is equivalent to an annual royalty payment of \$135 million per annum over the life of the Project. The Project will contribute approximately \$500 million per year in port and rail charges.

Additionally, the use of land for the Project is expected to contribute to Dalby Regional Council in terms of rate payments which will directly benefit the provision of services by Council to the community.

### 10.18.1 BENEFITS FOR BUSINESSES, INDUSTRY AND DEVELOPMENT IN THE REGION

The investment in the construction and operation of the Project is also expected to generate significant economic benefits to the region in the form of increased economic activity and employment. These benefits, would in turn lead to a steady increase in the region's population and subsequent demand for goods and services. The net effect for the development in the region would thus involve the encouragement of:

- » greater private sector investment in the Wandoan locality and region more generally as new and emerging businesses seek to supply the increase in demand for goods and services
- » an increase in the number and type of businesses across new and existing development areas
- » competition across new and existing development areas, reflecting growth in business activities, business expansion and new start-ups

### 10.19 HAZARD AND RISK

Potential hazards and environmental risks for each of the Project components (MLA areas, gas supply pipeline, and proposed raw water supply pipelines) have been identified and will be managed under an Emergency Response and Action Plan (ERAP). The ERAP will be developed in consultation with relevant stakeholders, in particular with each of the agencies of the Department of Emergency Services likely to be involved in any emergency: the Queensland Ambulance Service, the Queensland Fire and Rescue Service and the Rural Fire Service. The Queensland Police Service and Dalby Regional Council will also be consulted.

Dangerous goods used in the Project will be stored and managed in accordance with relevant guidelines.

During the construction and operations phases, the increased risk to the public from increased frequency of traffic on local roads will be carefully managed under the Project Traffic Management Plan. This will include ongoing awareness, fatigue management and ongoing liaison with the community.

### 10.20 HEALTH AND SAFETY

Potential health and safety risks for each of the Project components (MLA areas, gas supply pipeline, and proposed raw water supply pipeline) have been identified and will be appropriately managed. The Project's operating personnel will be exposed to the normal range of health and safety hazards associated with open cut coal mining operations, which will be well managed by the WJV health and safety systems that will be implemented under the *Coal Mining Safety and Health Act 1999*.



Under their conditions of employment, Project mine personnel will be subject to ongoing fatigue and awareness training and monitoring of driving habits.

The WJV's objective is to eliminate work related injuries and occupational diseases from its operations and to be recognised as a leader in occupational health and safety management. As part of its Health and Safety Policy, the WJV requires that health and safety are primary considerations in the activities of all its operations.

The community will be kept informed of expected changes in traffic through the Community Reference Group, newsletters and newspaper advertisements.

## 10.21 REHABILITATION AND DECOMMISSIONING

### 9.21.1 MLA AREAS

The fundamental objective of mine closure is to attain operationally and economically feasible closure while taking into account community priorities, environmental requirements, landform stability and sustainable rehabilitation.

Accordingly, the objectives for rehabilitation throughout the construction, operational and decommissioning phases of the Project are to:

- » ensure the land is in a condition and suitable for final uses which satisfy community, agency and landowners expectations
- » establish permanent, stable, self sustaining vegetation consistent with the post-mining land use
- » create stable landforms with rates of soil erosion not exceeding the pre-mine conditions

- » maintain downstream water quality, during the construction, operational and post operation phases of the Project.

The post-mining land suitability classes proposed to be established for the Project are:

- » undisturbed land returned to (or retained in) its pre-mining land suitability class, and should be able to be used for beef cattle grazing or dry land cropping as existed prior to mining
- » land used for infrastructure components of the Project (roads, MIA etc) should be returned to Class 4 cropping land or Class 3 grazing land, and generally be able to be used for beef cattle grazing, unless otherwise agreed with post-mine landowners
- » overburden stockpiles and tailing dam sites be returned to Class 4 cropping land or Class 3 grazing land, and generally be able to be used for low stock rates of beef cattle grazing, or alternatively for nature conservation
- » final voids to beneficial uses such as wetlands.

In order to achieve these objectives, landform design and rehabilitation success indicators are proposed, along with rehabilitation and decommissioning strategies.

From a social perspective, the Social Involvement Plan (including five yearly reviews) and Community Reference Group will be utilised, in addition to surveys and consultation with the local community and service providers, to ensure that community and agency needs and expectations for post-mining land uses and rehabilitation are addressed.

### 10.21.2 RAW WATER SUPPLY PIPELINE

At the end of mine life and closure of the Project, the pipeline will become surplus infrastructure and will be decommissioned. The following decommissioning options will be considered:

- » abandonment – where the pipeline is purged, and physically disconnected from the point of supply, and sealed (capped) at both ends
- » removal – where pipelines are purged and removed in entirety from the pipeline corridor
- » beneficial re-use – where sale or donation of the infrastructure to a third party occurs for other beneficial use.

### 10.21.3 GLEBE WEIR RAISING

The continued operation of the pipeline from Glebe Weir, if built, will be a commercial consideration for SunWater, based on the likelihood of other potential users of that pipeline if the mine was to cease operations.

## 10.22 CUMULATIVE IMPACTS

The Surat Basin is recognised as having significant mineral extraction related opportunities, including coal, petroleum and gas proposals. For that reason, the region is expected to be subject to increased mineral resource based development.

The Project is inter-related to three other major infrastructure projects in the region that are proposed to be developed over the next few years:

- » The Surat Basin Rail Project – a proposed 210km multi-user, open access rail line to be constructed from Wandoan to Banana by the Surat Basin Rail Joint Venture
- » Wiggins Island Coal Terminal – construction of new wharf and coal handling facilities at Wiggins Island, by Gladstone Ports Corporation
- » Port Alma – investigation and potential construction of new wharf and coal-handling facilities at Port Alma by Xstrata Coal Queensland Pty Limited.

While the projects are being developed by different proponents and are the subject of separate assessment processes, the proposed construction periods are likely to coincide, which may result in a range of beneficial and adverse cumulative impacts. Typically, cumulative impacts are moderate, in that the spatial and temporal boundaries are local and regional, and short to long term respectively.

Particular, the WJV has been working with the proponent for the proposed Surat Basin Rail Project, to ensure that the interrelationships and impacts of both projects are understood, and that the objectives of both projects may be met while effectively minimising and managing any cumulative impacts.

The key cumulative impacts are associated with land use, land clearing, groundwater and surface water management, landowners and sensitive receptors, the wider community, service providers, road traffic, noise, air quality, visual amenity, demands for accommodation and housing, and materials supply.

The Project, in conjunction with other proposed projects in the region, will result in changes to the regional population (through the influx of construction workforces and operations staff) which may have flow on impacts to the existing identities and social amenity of local communities. The WJV is working closely with the local Wandoan community, government agencies and the Surat Basin Rail Joint Venture through consultation forums, community workshops and a community reference group to manage cumulative social impacts of the Project. In addition, the WJV has considered the Queensland Government's Sustainable Resource Communities Policy, which has been developed in response to continuing growth of resource communities.

Consideration of the new Sustainable Resource Communities Policy will aid in management of educational facilities, and medical and health services, in co-operation with relevant government departments.

The moderate beneficial cumulative impact for the local area and region would result with effective implementation of Sustainable Resource Communities Policy objectives, which includes:

- » strengthening the Government's co-ordination role, including assisting in Social Impact Plan negotiation and implementation
- » improving linkages between social impact assessment and regional planning
- » fostering partnerships between local government, industry and community
- » an enhanced regulatory environment for social impact assessment.

## 11 SUMMARY OF COMMITMENTS

The WJV has committed to a number of measures to reduce and manage potential impacts from the Project, as well as enhance the environmental, social and economic benefits. These measures have been developed to reflect the outcome of consultation with the local community and relevant key stakeholders, as well as the WJV's commitment to sustainable development. A full list of Project Commitments is provided in Chapter 28 of Volumes 1-3, and Chapter 22 of Volume 4. In summary, key commitments made by the WJV in relation to the mine and related infrastructure include:

- » All operations will be conducted in accordance with the Environmental Management Plan, Environmental Authority and current Plan of Operations.
- » To avoid and manage potential impacts on **local accommodation and housing**, the WJV will:
  - › develop accommodation facilities for mine construction and operations staff as well as maintenance shutdown crews
  - › progressively construct 15 houses and 10 duplexes (or equivalent) for its staff settling in the Wandoan area
  - › work with the Dalby Regional Council on the development of land for the mine housing requirements within the Wandoan area
- » To reduce the mine's **environmental footprint**, promote **energy efficiency** and **reduce direct greenhouse gas emissions**, the WJV makes the following commitments:
  - › Process water will be recycled and beneficially reused within the MLA areas
  - › The WJV will investigate and implement where practicable the collection and



beneficial reuse of grey water from the accommodation facilities and MIA

- › The WJV will assess the viability of capturing rainwater for beneficial reuse associated with the MIA and accommodation facilities
- › Progressive disposal of rejects into the voids of already mined pits to reduce the environmental footprint
- › The area of disturbed land at any one time will be minimised as far as practicable
- › Progressive rehabilitation will be undertaken over the life of the mine to minimise the cleared footprint of the mine at any one time
- › An energy efficiency audit will be undertaken, where appropriate, during the detailed design phase
- › The use of high efficiency electrical motors throughout the mine site
- › Installing light-sensitive switches on lighting equipment and energy efficiency lightbulbs, where practicable
- › Installation of energy saving devices, where practicable
- › Regular monitoring and maintenance of equipment to maximise performance and minimise electricity and fuel consumption
- › The mine plan will be designed to take into account minimisation of fuel usage by trucks and other equipment
- › In developing the accommodation facilities, the WJV will endeavour to use leading industry practice in terms of sustainability and energy efficiency, including design maximising air flow, shading and beneficial landscaping, use of energy efficient (eg. Solar) hotwater systems, water saving devices and energy efficiency lighting. The WJV has committed to investigating and implementing, where practicable, roof-mounted solar hot water systems, rainwater capture and beneficial

reuse of grey water associated with the accommodation facilities as part of the detailed design process

- › The WJV is investigating renewable energy sources for components of the Project, such as the mine accommodation facilities. This may include on site solar generation
- › The above measures will be incorporated into a Greenhouse Gas Reduction management plan.
- » The WJV makes the following commitments to **improve local infrastructure** within the Wandoan area (subject to agreement being reached between the WJV and Dalby Regional Council):
  - › developing a public airstrip near the Wandoan township or upgrading the existing Taroom airstrip
  - › assisting the Council to develop a new multi-user municipal waste and recycling facility for the Wandoan area, to be owned, managed and operated by the Council
  - › upgrading the existing potable water treatment facilities in Wandoan township
  - › upgrading the wastewater treatment plant facilities in Wandoan township
- » To support **social sustainability** for the Wandoan township and region, the WJV commits to:
  - › developing, in consultation with the Wandoan community, a Social Involvement Plan that will provide for (among other things):
    - A facilitated process for community involvement in determining their future goals and aspirations
    - Development of appropriate and agreed key performance indicators to measure the Plan's performance
    - Provision for annual internal review and five yearly external review, based on surveys, consultation with the local communities and local service providers
  - › keeping the community informed of Project activities and provide for community feedback to the WJV through measures such as:
    - preparation and distribution of regular newsletters
    - shopfront displays
    - continuing to operate a 1800 telephone hotline
    - employment of a Community Liaison Officer, based at Wandoan

- continuation of community forums – i.e. community reference group, etc
- › working with government and non-government services providers as a means to ensure an appropriate level of community services continue to be available within the Project area and region
- › working with local health providers and government agencies to plan for future health service needs
- › working closely with the Queensland Police, particularly in relation to traffic management and associated road safety issues
- › developing behaviour protocols for all its employees working on the Project, as part of a robust site induction process, including employee sign-off
- › developing, in cooperation with relevant government agencies, a local employment and training policy, particularly in relation to provision of apprenticeships/traineeships for local youth and the school-based training through partnerships with local schools and training institutions
- › undertaking a skills audit within the local communities to provide an understanding of the range of skills and experience available locally and to determine where training opportunities could be directed
- › implementing a tendering process for Project construction and operation supplies and services to encourage participation by local business
- › developing a Business and Employment Register to enable local and regional firms and interested persons to be included on a Project information database
- › encouraging the development of business and service provider support networks.
- » Overall, the Project recognises the important sense of community, sense of security, participation in community events, and the volunteer mentality. The WJV aims to embrace, encourage and enhance these aspects of the community.
- » In relation to **indigenous cultural heritage**:
  - › The WJV, in consultation with the Iman People #2, has developed a Cultural Heritage Management Plan (CHMP).
  - › At all times, the WJV will comply with its duty of care obligations under relevant legislation.
  - › If the gas supply pipeline is to be built, the WJV will seek to engage with the Iman People # 2 in relation to a CHMP for the gas supply pipeline area.
- › In relation to the raw water supply options, depending on which option is selected, the WJV will invite the relevant aboriginal parties to be involved in the process of a CHMP for the water supply pipeline area. The CHMP will provide for comprehensive surveys over the proposed pipeline area.
- » In relation to **non-indigenous cultural heritage**, a range of mitigation measures have been developed in consultation with the local Wandoan community and the Juandah Historical Society, and will be incorporated into the Project EMP to minimise the Project's impacts on identified items. This may involve assisting in the development of a community based oral history study to document the local history of Wandoan and to mitigate against the impact of the proposal on the historical knowledge within the local community.
- » In order to avoid, minimise and manage impacts of the Project on **biodiversity**:
  - › The WJV will develop and implement a Biodiversity Offset Strategy that will aim to provide a net improvement in ecological value as a result of the Project, including providing protection immediately for an equal or greater area of similar habitat as that lost through the Project. The Offset Strategy will be developed in accordance with the following:
    - A mixture of offsets providing immediate protection and those produced to provide additional natural bushland during development of the mine is proposed.
    - The draft strategy proposes a target ratio of up to 3:1 in terms of the vegetation protected in offsets compared with that disturbed by the Project's mining operations.
    - It is proposed to actively increase the habitat value of the offset areas through appropriate means which may include planting of native species
    - The WJV will rehabilitate some mining areas for nature conservation which will provide further habitat, further contributing to the long term ratio of conserved vegetation to vegetation disturbed by the Project.
  - › The WJV will develop a Biodiversity and Land Management Plan prior to the start of construction to minimise impact on terrestrial and aquatic ecology from construction and operational phases of the Project. The Plan will,

where appropriate, address the recommendations set out in Chapter 17A, section 17A.5.1, or “equivalent or better” mitigation measures that may be identified during the life of the Project.

- › As part of the Plan, weed and feral animal management will be developed, including vehicle wash down procedures to limit edge effects such as the establishment of declared weeds.
- › Sensitive areas that contain or are likely to contain fauna habitat and are to be disturbed by mining activities, will be cleared of fauna as far as practicable prior to the commencement of the relevant construction and/or operational activity by either a trained ecologist or other qualified environmental specialist.
- › During the life of the mine, areas to be rehabilitated will be revegetated where practicable in keeping with company policy and the existing vegetation types.

## 12 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are drawn from the EIS.

### 12.1 CONCLUSIONS

While the Wandoan Coal Project has the potential to have environmental, social and economic impacts, the majority of the adverse impacts associated with Project will be mitigated. However, significant positive benefits will flow through to the local, regional, State and national economies.

The EIS has demonstrated that the Project will provide significant direct and indirect employment opportunities at the local, regional, state and national levels. The Project will also generate substantial revenue for the Queensland Government, with over \$3.7 billion in royalty payments over the 30 year life of the mine, and over \$500 million in annual port and rail charges. The Project will provide significant annual contributions to Dalby Regional Council in local government rates.

The WJV has committed to a range of measures to protect and enhance the natural environment, including a Biodiversity Offsets Strategy and other Project management plans to minimise potential impacts. Subject to agreement with Dalby Regional Council, the WJV has committed to fund an upgrade to the Wandoan Potable Water Treatment Plant, including installation of a cooling tower which will reduce reticulated water temperatures, as well as an upgrade of the Wandoan Wastewater Treatment Plant to manage requirements for construction, operational and future town growth.

Mining and related infrastructure impacts on Matters of National Environmental Significance

have been assessed, specifically listed threatened species and ecological communities, and with appropriate mitigation, found to be negligible.

The Project is expected to have negligible impacts on users and environmental values of groundwater from the Great Artesian Basin and sub-artesian bores. The WJV has committed to make good any water losses caused as a direct result of mining activities.

The WJV has three options for raw water supply during operations. The WJV has assessed two options – one from coal seam methane water 93km to the south of the MLA areas, and a second option from coal seam methane water 91km to the west of the MLA areas. The assessment has demonstrated that a pipeline from either source can be built with minimum environmental impact, and minimum disturbance to existing land uses.

In relation to a third raw water supply option, Glebe Weir raising and pipeline, SunWater has assessed that it will be able to provide a reliable high priority water supply to the WJV. Importantly, the assessment and studies undertaken for the Glebe Option indicate that:

- › adverse impacts are able to be mitigated to a satisfactory level
- › Matters of National Environmental Significance will not, following mitigation and offset, be adversely impacted
- › there is significant beneficial impact in many instances, including increased habitat for migratory species
- › additional proponent commitments will contribute significantly to sustainable outcomes for the Glebe Option.

The operational impacts of the mine on air quality, noise and vibration have been demonstrated to be capable of mitigation to minimise disruption to the community.

The WJV will maintain its existing communication measures developed during the consultation program for the EIS with the Wandoan community. This will assist in on-ground activities as the Project progresses and ensure the community is kept informed of development through the provision of timely and accurate information together with information about opportunities to be involved in and benefit from the Project.

The WJV, with the Iman People #2 (and, in the case of the southern CSM water supply pipeline option, the Barunggam People), will agree to Cultural Heritage Management Plans (CHMP) for management of Indigenous cultural heritage on all relevant Project activities. If required, Sunwater will work with the Wulli Wulli People and the Iman People #2 for management of Indigenous cultural heritage for the Glebe Option. The WJV will also work with the community and the Juandah Historical Society in relation to management of local non-Indigenous cultural heritage.

Based on the environmental impact assessment, draft Environmental Management Plans (EMPs) have been developed to manage impacts from the mine and related infrastructure, potential gas pipeline and water supply pipeline options. The draft EMP for the mine will form the basis of the Project EMP required for the purposes of the Environmental Authority under the *Environmental Protection Act 1994*.

Overall, the investment in the Project is expected to increase the level of economic activity for regional, state and national economies. This in turn is expected to lead to improved prosperity as incomes, employment and demand for goods and services increases during the life of the Project. Given the strong demand for the Project, the level of benefits of the Project and the commitment by the WJV to mitigation to offset negative impacts, the Project should proceed.

## 12.2 RECOMMENDATION 1

Having regard for the benefits and the impacts of the Project presented in this EIS, it is a recommendation of the EIS that the Project proceeds, subject to:

- » developing and implementing detailed environmental management plans for the construction phase and the operational phase
- » developing and implementing a scheme of effective mitigation measures and proponent commitments.
- » In making the recommendation, the Coordinator-General is requested to:
  - › evaluate the EIS
  - › recommend the Project proceed
  - › state conditions for the Project under section 49(1)(a) of the *State Development and Public Works Organisation Act 1971*

## 12.3 RECOMMENDATION 2

It is a further recommendation of this EIS to the Coordinator-General that:

- » necessary approvals and permits be sought for the Project including as required as listed in Chapter 3 of each Volume of this EIS; and
- » The WJV and the Queensland Government investigate measures to ensure suggested programs, budgets and resources be included in the relevant agency planning processes to ensure ongoing provision of services to the local community.

## 12.4 SUBMISSIONS ABOUT THE EIS

Anyone may make a submission to the Coordinator-General regarding the EIS during the public notification period. Properly made submissions will be given consideration by the Coordinator-General prior to preparing an evaluation of the EIS.

The Coordinator-General has set an eight week submission period for the receipt of public submissions about the EIS. The EIS will be advertised in *The Weekend Australian*, *The Courier Mail* and local newspapers circulating in the Project area, including *The Chinchilla News* and *The Western Star*. The process on how to make a submission, locations of copies of the EIS, and the notification period, will be nominated in the advertisements. 'Properly made submissions' are defined in Part 4 of the SDPWO Act as submissions that are:

- » made to the Coordinator-General in writing
- » received on or before the last day of the submission period
- » signed by each person who made the submission
- » state the name and address of each person who made the submission
- » state the grounds of the submission and the facts and circumstances relied on in support of the grounds
- » any other submissions determined by the Coordinator-General to be acceptable

Copies of the EIS will be available for viewing at:

- » Wandoan –
  - › Library and Council Customer Service Centre,
  - › WJV's Project Information Centre in Royds Street Wandoan, (next to the pharmacy)
- » Taroom – Library and Council Customer Service Centre
- » Miles – Pioneer Library

Submissions about the EIS may be made to:

The Coordinator-General  
 Attention: Project Manager – Wandoan Coal Project  
 Significant Projects Coordination  
 Department of Infrastructure and Planning  
 PO Box 15009  
 CITY EAST QLD 4002  
 Tel: (07) 3234 0540 Fax: (07) 3225 8282  
 Email: wandoan@dip.qld.gov.au



xstrata  
coal